ADDIS ABABA UNIVERSITY

SCHOOL OF GRADUATE STUDIES

SCHOOL OF INFORMATION SCIENCE

Knowledge Management Maturity at Ethiopian Airlines

Seble Abera

JUNE 2015

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A Thesis Submitted to the School of Graduate Studies of Addis Ababa University in Partial Fulfillment of the Requirements for the Degree of Master of Science in Information Science

By

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Rahel Bekele (PhD)	
Advisor	Signature
Examiner	Signature
Examiner	Signature

Declaration

I declare that the thesis is my original work and has not been presented for a degree in any other university.

_____

Date

This thesis has been submitted for examination with my approval as university advisor.

_____

Advisor

Dedicated to

My beloved husband Tarekegn Assefa

ACKNOWLEDGEMENT

Faithful **GOD!** Thank You for giving me the strength, grace and letting this happen.

Dr. Rahel, I am so lucky to have you as course instructor and later as an advisor. Your unreserved guidance from the very beginning and persistent follow-up to shape up the research work took me this far. Now, I am here to appreciate and thank you.

I would also like to thank all Ethiopian Airlines employees, particularly those who willingly participated in the survey. My especial thanks go to members of **EAL senior management** group who spared to me their precious time for interview. I am also highly indebted to my friends, **Etalem Dender and Yared Melaku**, for their countless support during the questionnaire development and data collection. I feel also fortunate to meet **Elsa Taddele** as colleague, classmate and friend – she was my source of courage throughout the journey.

Thank you, my best friends **Martha H.** and her husband **Tafesse F**; you were so generous to me in availing your private office for my study throughout the course periods.

It was a source of positive energy to me to hear an encouragement and receive support from my beloved friend **Martha N**. and my sister **Wessen** abroad. Thank you so much dears.

At last, but not the least, I would like to thank my families from the bottom of my heart. My husband, **Tarekegn**, you have always been providing me your unflinching support to my success, I sustained my effort because of you and don't have enough words to thank you. My sweet children - **Brook, Ydidya, Abigail and Nathan** - thank you for allowing me to steal your time to the extent taking up my responsibilities by yourself. Thank you**,** my mom **Tsehay** for your support by filling the gap with my children.

Seble Abera,

June, 2015

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LIST OF ACRONYMS

ACE – Achieving Competitive Excellence

CKO – Chief Knowledge Officer

CoE – Center of Excellence

EAL – Ethiopian Airlines

HCM – Human Capital Management

ICT – Information and Communication Technology

IM – Information Management

KM – Knowledge Management

MRO – Maintenance and Repair Overhaul

SBU – Strategic Business Unit

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ABSTRACT

Knowledge has been perceived as the key strategic asset of an organization in the current competitive and unprecedented business environment, particularly in the vulnerable airline industry. To this effect, measuring the organizational knowledge management (KM) readiness is paramount. Accordingly, this research is intended to evaluate the KM practices in Ethiopian Airlines so as to determine the maturity level therein and explore improvement areas for effective KM establishment. In view of that, the evaluation has been made by adopting Kruger's (2008) Knowledge Management Maturity (KMM) model. Besides, Kruger & Snyman (2007) instrument was used for both quantitative (questionnaire) and qualitative (interview) data collection. From the analysis it was established that the overall level of KM maturity reasonably matches with position level (managerial and non-managerial) of KM maturity. As a whole, according to Kruger's (2008) levels of maturity, EAL noted to be at the 'manage' level of the four staged classification. The findings further determined that EAL has entered to Phase 3 but is not ready to reach Phase 4 taking the detailed six-phased classification of same model.

Based on the findings of this study, a number of recommendations that cover outside interaction, KM policy & strategy, training & awareness, and ICT infrastructure were forwarded to improve the KM maturity level. Moreover, future research directions for the benefits of the case organization and other industries in Ethiopian context have been provided.

Keywords: Knowledge Management, Knowledge Management Maturity Models, Knowledge Management Maturity Levels, Ethiopian Airlines.

CHAPTER I

INTRODUCTION

1.1. Background

Ethiopian Airlines (EAL) is the flag carrier airline based in Ethiopia which was founded as international airline in the year 1946. Its successful journey of the past sixty eight plus years, witnessed that Ethiopian Airlines is one of the African continent leading carriers, with high record of efficiency and operational success, turning profits for almost all the years of its existence. [1]

EAL's current Vision - "Vision 2025" - was coined in the year 2009 as " Ethiopian Airlines will be the most competitive and leading aviation group in Africa by providing safe, market driven and customer focused passenger and cargo transport, aviation training, flight catering, MRO (Maintenance, Repair & Overhaul) and ground services by 2025" (EAL, 2009). In line with this vision, EAL has defined its mission with three key statements:

- To become the leading Aviation group in Africa by providing safe and reliable services whose quality and price "value proposition" is always better than its competitors.
- To ensure being an airline of choice to its customers, employer of choice to its employees and an investment of choice to its owner.
- To contribute positively to socio economic development of Ethiopia in particular and the countries it operates in general by undertaking its corporate social responsibilities and providing vital global air connectivity.

[1] Ethiopian airlines official website
http://www.ethiopianairlines.com/en/corporate/history.aspx (accessed on July 15, 2014)

Accordingly, EAL is working towards Vision 2025 by stretching its direct service routes to 85 international destinations over different continents and 20 domestic flight sectors.[2] EAL has more than 8,000 employees including staff at outstation international locations.

The dynamic nature of Airline industry necessitates fast responsiveness to the market demand, particularly to the ever changing customer needs and tastes (Foon and Eurn, 2011). In addition, the competition is global which triggered collaboration that is currently being pursued in the industry centered on strategic partnership and alliances. To this end, having inter linked knowledge management practices in the industry's process is recognized as crucial to achieve the competitive advantage (Foon and Eurn, 2011; Dadashkarimi and Asl, 2013; Jenatabadi, 2013). Accordingly, EAL in line with Vision 2025, has succeeded to join the biggest alliance, Star Alliance, in December 2011 which expands the airline's market network in the world. Furthermore, the organization recently restructured itself into seven profit centers or Strategic Business Units (SBUs); namely, Ethiopian Domestic and Regional Airline, Ethiopian International Passenger Airline, Ethiopian Cargo, Ethiopian Maintenance and Repair Overhaul (MRO), Ethiopian Aviation Academy, Ethiopian Inflight Catering Services and Ethiopian Ground Services (EAL, 2009). These SBUs require seamless linkage to work in synergy towards attaining the corporate objectives or Vision. In this regard, the respective business strategies and corresponding corporate level functional strategies (strategies such as ICT, HRM, Customer Service…etc) are defined in Vision 2025 (EAL, 2013).

Moreover, the value statements, which are pointed out on EAL's strategic road map, underline the importance of knowledge management (EAL, 2009). To this end, in an effort to cope up with the airline volatile market and competition, EAL is trying to apply several initiatives including but not limited to building employees' knowledge by adopting best practices, promoting organizational culture, gaining and dissemination of knowledge through electronic as well as manual channels. Besides, the organization attempts to make knowledge resources available using working manuals and guidelines, the website, intranet (corporate portal), the mentoring & coaching programs, succession plan and crew meetings.

[2] http://www.ethiopianairlines.com/en/corporate/fleet.aspx (accessed on September 08, 2014)

Knowledge management involves cyclical activities from creation through application of the knowledge. Thus, organizations can maximize the benefits out of the knowledge resource by identifying and managing knowledge that positively affect organizations' performance (Greiner et al, 2007). To this effect, establishing metrics to evaluate KM practice of organization' initiatives to create, acquire, store, share or transfer and use of the required knowledge is paramount. Therefore, in this study EAL has been taken EAL as the case to be evaluated for knowledge Management (KM) maturity since the corporate objective indicates the significance of knowledge and the industry is known for knowledge reliant.

1.2. Statement of the problem

While knowledge has become more and more crucial for organizations to leverage competitiveness, its fluid nature makes management of same difficult and challenging task (Dalkir, 2005). Further, Dalkir stated that the capability to manage knowledge evolved as business's essential component to render efficient services or products and is no longer a choice but has become a survival issue. On the other hand, explicitly recognizing knowledge as corporate asset is relatively a new concept which demands appropriate management and investment like any other tangible asset management. According to Danvenport and Prusak (2000), today's globalized business demands companies to have the capacity to exploit its knowledge and learning capabilities in order to take the competitive advantage over its rivals and exist in the business. Thus, knowledge management is getting greater attention by many organizations and is recognized as fast growing approach.

Due to the above mentioned reasons, business organizations are increasingly investing in knowledge management initiatives to promote the sharing, application and creation of knowledge to improve efficiency and competitiveness (Grundstein, 2008). In this regard, the Economist in its 2005 issue indicated that Knowledge Management and Business Intelligence tools are the most important underpinning technology for competitive firms. Hence, the growing demand for establishing effective knowledge management that can support company's strategic objective has been realized.

Subsequently, different organizations are forced to assess the effectiveness of the existing KM practices and evaluate the capability of managing the available knowledge resources.

According to Dalkir (2005), organizations must have measurement metrics to assess intellectual capital and how it is benefiting them. To this end, some studies on the KM assessment or the KM maturity level of different organizations and corresponding recommendations on improvement areas showed the relevance of measuring KM practices (Wijetunge, 2012; Salojarvi, Furu and Sveiby, 2005). The results of these studies mainly illustrate the evaluation of KM practices for the company's growth in an integrated manner.

As cited above, the strategic importance of KM for the competitive advantage of business organizations is noted to be undisputable. In relation to this, Airline business is well known for its globally fierce competition. Consequently, the success of airlines emanates from how quickly and flexibly airlines respond to changes in customer demand, an uncertain business environment and competitors challenges; which basically relies on multidimensional knowledge management aspects (Foon and Eurn, 2011). Moreover, the study of Dadashkarimi and Asl (2013) which assessed the impacts of knowledge management practices in different airlines revealed that airlines' performance have a significant relation with the prevailing knowledge management practices. Hence, evaluating and improving knowledge management practices in business organizations; particularly in airline industry is vital.

Ethiopian Airlines (EAL), being not an exception in the industry requires well defined knowledge management and evaluation technique to ensure whether taking the competitive advantage out of it. In addition, EAL is currently working in alliance with other business partners that demand fast and seamless adoption of best practices & standards. Moreover, it is organized into seven strategic business units; such decentralization of business as specified in Dalkir (2005) requires enterprise wide capabilities to manage knowledge resource so as to leverage its collective intellect. In this regard, Ernst & Young (2005) consultants had identified the gap in knowledge transfer in EAL and evaluated the communication strategy to be at awareness stage which was ranked as the lowest for such highly knowledge-based service market of airline business. Further, it was recommended that the need to refine overall airline knowledge as well as people skills and identified the need to include strategies to transfer knowledge as key action step in building capability.

It is noted that the effectiveness of knowledge management practices are gray area for the organization as there is no defined measurement metrics. In addition, there is no structurally defined knowledge management practice that could be objectively evaluated so as to ensure utilization of knowledge for competitive advantage. Furthermore, nothing evidenced that EAL's KM practices are examined and measured so far. On the other hand, EAL value statements[3] advocate the criticality of knowledge management in achieving its strategic goals. Hence, it is essential to evaluate where EAL is now with respect to effective KM practices so as to keep the organization informed of where to deploy appropriate resources and optimally use knowledge. Needless to say that knowing the current KM maturity level would help the organization as guidance on how to improve to higher level of maturity and serve as baseline for future maturity measurements.

Consequently, within the general framework of identifying level of KM maturity at EAL, the study attempts to answer the following general research question through the under listed detailed questions:

- To what extent does EAL support effective KM practices?
  - What are EAL's principles towards KM?
  - What are the initiatives that EAL exhibits towards formulating organizational KM Policy and Strategy?
  - To what extent do structured KM processes are implemented in EAL?
  - To what extent does EAL use Information and Communication Technologies (ICT) and Information Management (IM) to enhance knowledge management processes?
  - How does EAL interact with outside environment for practical knowledge exchange?
  - What is the maturity level of EAL KM practices based on KM maturity model?

[3]Among the values statements such as "high performance and learning organization with continuous improvements, innovation and knowledge-sharing", "the need to act in an open fashion and be result-oriented, creative and innovative" and "encourage 360° free flow and sharing of information" are statements that directly advocate the importance of knowledge for EAL competitive advantage (Ethiopian Airlines Official website: http://www.ethiopianairlines.com/en/corporate/visionmission.aspx accessed on July 15, 2014)

1.3. Objective of the study

1.3.1. General objective

The general objective of the study is to measure KM maturity in Ethiopian Airlines with respect to the organization's KM Principles, Knowledge policy, KM strategy, ICT and Pervasive knowledge so as to determine the maturity level and forward recommendation/s on identified improvement areas.

1.3.2. Specific objective

In order to achieve the general objective of this study, the under listed specific objectives are set:

- to identify KM principles that are integrated into day to day EAL's activities
- to identify the extent of EAL's organizational structure, policy and strategy enable effective knowledge management
- to evaluate the degree to which KM practices are implemented in EAL
- to evaluate the existing ICT with respect to its support for knowledge management activities in EAL
- to examine the level of knowledge exchange with outside organization
- to determine EAL KM maturity using specific KM model and forward recommendation

1.4. Significance of the study

KM is a growing concern and presently, it is a hot research area to which a number of scholars fascinated at it. Nevertheless, it is at its infancy in Ethiopia context and as far as the researcher's knowledge, no attempt has been made to measure KM maturity in local Business Organizations'. Hence, this study is significant to the practitioner in EAL as well as other comparable airlines in the industry. Besides, it can also serve as input for other industries those taking knowledge as a tool for their competitive advantage in achieving strategic objective. Furthermore, the study indicates the relevance of measuring organizational knowledge management as a pre-requisite so as to able to progress with the KM practices.

Moreover, researchers in the area of knowledge management, particularly those involved in measuring knowledge management maturity, are also beneficiaries of this study. That is, the researchers can gain a better understanding of how knowledge management is playing a significant role in organizations and the possibility of measuring KM growth taking different organizational aspects into consideration. In addition, the study will also aid to get acquainted with several methods of measuring knowledge management while attempting to apply one for a specific case at hand or to develop/improve the existing measurement parameters. To this end, researchers can use same as an input for other research of different organization or further study on same organization with additional perspectives.

1.5. Scope of the research

The research focuses on determining KM practices maturity level in Ethiopian Airlines and propose recommendations for improvement. Thus, the main aim of the study is to examine existing KM initiatives in EAL, evaluate the maturity using one of the tested KM maturity model and analyze the findings to forward recommendations for improvement. To achieve this, the study uses input data restricted to employees at Ethiopian Airlines Head Quarter. As a result, the corresponding data analysis and conclusions are drawn based on the facts gathered from sample employees at EAL Head Quarter.

1.6. Limitations of the research

In the process of the study, the researcher has encountered some constraints. The first one is the limited size and coverage of sample due to resource limitations. The other constraint is absence of abundant knowledge on knowledge management concept among EAL employees. To this end, the researcher exerted maximum effort to create awareness and provide organized briefing upon disseminating the questionnaire. In addition, the interviewees were selected with great care to incorporate knowledgeable and their activity believed to relate to the area. The last constraint that the researcher came across was the difficulty to find literatures that was directly related to measuring KM maturity in the context of airline industry. However, getting research works on KM maturity evaluation of some other industries and other perspectives of KM in airline industry made the study well supported with the conceptual foundation.

1.7. Organization of the thesis

This paper is organized into five chapters. The first chapter, introduction, is discussed here above with sections including the problem statement, the objective, significance and scope of the study. In the second chapter, literature reviews on theoretical concept and related works are presented. Chapter Three describes the research methodology that this study has followed while the findings are discussed in the Fourth chapter. Finally, in chapter Five, thesis summary is provided in the conclusion part and recommendations along with future research directions are forwarded in subsequent sections of same chapter.

CHAPTER II

LITERATURE REVIEW

2.1. Conceptual background

2.1.1. Knowledge

A notion of consensus noted among different researchers and practitioners that knowledge is more than mere data and information. Knowledge emerges in the context of individual with his belief and experience (Greiner et al, 2007). As a result, Davenport (2000) defined knowledge as fluid mix of framed experience, values, contextual information, expert insight and grounded intuition that provides an environment and framework for evaluation and incorporating new experiences and information. But, the knowledge that originates in individuals context eventually embodied in teams and organizations. Knowledge can broadly be distinguished as tacit and explicit. Explicit knowledge is the one we found in recorded format or can be codified easily. Whereas tacit is essential knowledge which is found in the minds of the individuals and hence difficult to articulate (Dalkir, 2005). In an organization, explicit knowledge can be exemplified with strategies, methodologies, Processes, patents, products, and services. On the other hand tacit knowledge involves skills, competencies, experiences and relationships. Knowledge is also embedded in work processes and it exists in all core functions of an organization as well as in its systems and infrastructure. However, tacit and explicit knowledge are not exclusive since the latter is grounded in the former through externalization (Greiner et al, 2007).

Tiwana (1999) discussed the four levels of knowledge with respect to the level of intellect and prevailing knowledge management system support. The initial level is “Know-what” at which the knowledge is cognitive in that the knower might have the knowledge of what should be done, theoretically, but ever done it in real life. Then comes the level of “Know-how” which basically represented with information oriented and rule based problem solving processes. The third level is “know-why” that is beyond “know-how” as it is knowledge oriented to deal with unknown interactions and unseen

situations. At this level deep knowledge is acquired to handle complex problems by analyzing cause-and-effect. The final level is "care-why" which represented by self-motivated creativity that exists in a company. At this level highly motivated, creative and energetic employees help their company to outperform as knowledge exists as company's culture.

Generally, the integral part of knowledge is the capability to understand, comprehend, use, reuse and combine data & information with existing knowledge for better result (Sajjad, 2014). According to Kruger (2008), the mere fact that organizations exist and survive indicates that a certain amount of knowledge is available within the organization. Further the study emphasizes that primarily knowledge resides in the head of the knower and if not shared formally, it could be difficult to manage as strategic resource. Davenport (2000) supported this conceptual theory by describing the increasing trend towards valuing organizational knowledge as strategic resource and effort to manage.

2.1.2. Knowledge Management (KM)

KM is a broader concept that becomes increasingly important as the importance of knowledge increases. KM identified as beneficial to individuals, communities and/or organizations (Dalkir, 2005). KM's benefits to the organizations may be divulged through knowledge-driven strategies, improved products and services, capability to stay better in a competition and the ability to build organizational memory. Accordingly, different scholars defined KM in different ways: according to Dadashkarimi and Asl (2013) it is the process of creating, collecting, organizing, disseminating and utilizing knowledge. Moreover, Watson (2003) and Nonaka (1994) further explained that most important intangible asset of every organization is knowledge which requires considerable management like any other tangible assets.

Currently, organizations start to learn on how to manage their intangible assets, knowledge. Though, KM is the practice of managing the intangible assets of an organization and is being started since human awareness of knowledge, it emerged as a professional discipline in recent years (Grundstien, 2008; Peter and Rada 2014). In this

regard the main argument noted as KM is important to the extent that it enhances an organization's ability and capacity on leveraging knowledge to improve organizational performance and results. But, KM is not an end by itself but it is a means to an end for organizational success (Dlalkir, 2005; Watson, 2003).

Alavi and Leidner (1999) have conducted a study to ascertain the meaning that managers ascribe to the concept of knowledge management and three perspectives emerged: an information-based perspective, a technology-based perspective, and a culture-based perspective.

i) Information-based perspective:

Managers describe knowledge management as it is about characteristics of information, such as readily-accessible information, real-time information, and actionable information. Its focus is concerned with reducing the overload of information by filtering the useful ones separately.

ii) Technology-based perspective:

Managers associate knowledge management with various other systems such as data warehousing, enterprise wide systems, executive information systems, expert systems, and the intranet, as well as various tools (e.g., search engines, multi-media, and decision making tools).

iii) Culture-based perspective:

Managers associate knowledge management with learning (primarily from an organizational perspective), communication, and intellectual property cultivation. It is also suggested that the information technology component of knowledge management was only 20% of the concept whereas the cultural and managerial aspects accounted for the bulk of the issue.

In general, the effectiveness of knowledge management is determined by the knowledge infrastructure such as technology, structure and culture along with knowledge process architecture that are acquisition, conversion, application and protection

Subsequently, these phases of the knowledge management cycle represented in different models as depicted below:

Table 1: KM Cycle
Gupta and Sharma (2004)

Model	Phase 1	Phase 2	Phase 3	Phase 4	Phase 5	Phase 6
Despres and chauvel	Creation	Mapping	Storing	Sharing/ transmission	Re-usage	Evolution/ Inference
Gartner group	Creation	Organization	Capturing	Access	Usage	-
Davenport and Prusal	Generation	-	Encoding	Transmission	-	-
Nissen	Capturing	Organization	Formalization	Distribution	Usage	-
Amalgamated	Creation	Organization	Formalization	Distribution	Usage	Evolution/ Inference

Further, Watson (2003) described the act of managing knowledge with four characteristics. These are namely, 1) acquire knowledge which includes learn, create or identify; 2) analyze knowledge consisting of assess, validate or value ; 3) preserve knowledge which relates to organize, represent or maintain; 4) use knowledge which means apply, transfer or share. It is also indicated that the choice of words at each phase doesn't matter as the whole activity does not exist in isolation; rather cyclical. In relation to this, Dalkir (2005) discussed several approaches to KM cycles and finally introduced an integrated KM cycle with three major stages as shown in Figure 1. The first stage is knowledge capture and/or creation where by knowledge capture refers to the identification and codification of usually unnoticed knowledge whether from internal or external sources. Whereas creation is about the development of new knowledge or know-how that did not have previously exist in the organizations. Then, passing through the assessment (which involves content validity, sufficiency and usability) knowledge sharing and dissemination will come to the picture. At this stage the existing knowledge will be availed for users so as to able to contextualize and hence to apply subsequently. The 3rd and last stage is the knowledge acquisition and application at which the key attributes of knowledge identified in order to match with a variety of users and to make

use of the content. Then the loop cycle back for update and reiterate the process as users keep on validating the existing knowledge usefulness and providing signal on the out dated.

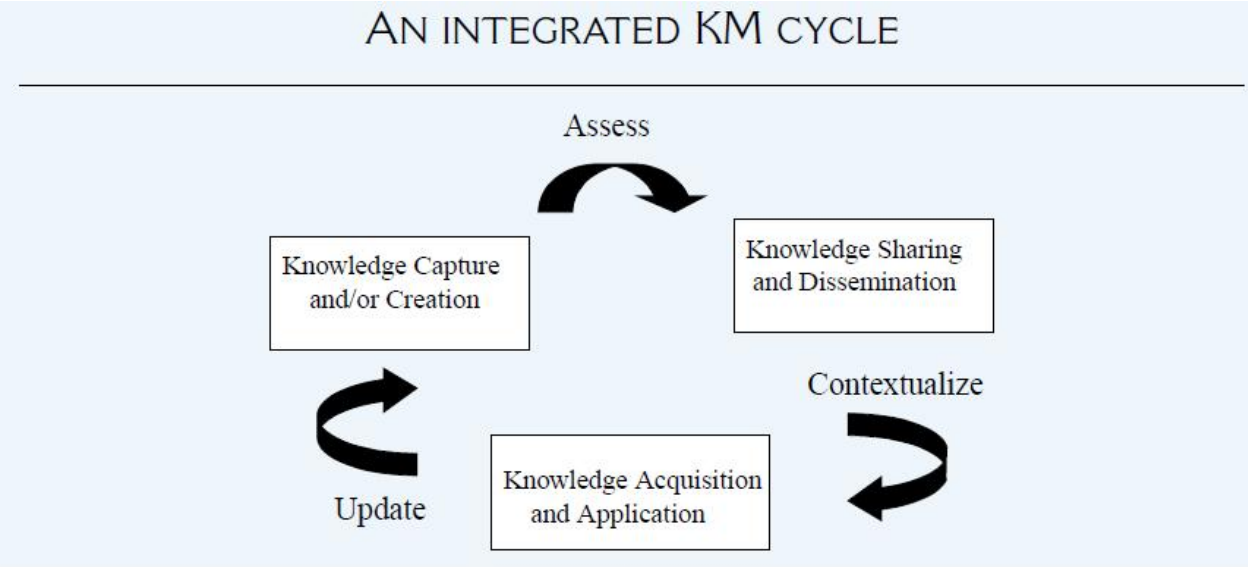

Figure 1: The Knowledge Management Cycle. Dalkir (2005)

In Grundstien (2008) research work, KM is stated as "the management of activities and the processes that enhance the utilization and creation of knowledge within an organization". These activities may involve formalized knowledge, patents, laws, programs as well as more intangible know-how, skills and experiences (Watson, 2003). Thus, KM is taken as key factor in business organization for improved efficiency and competitiveness. In relation to this Peter and Rada (2014) discussed claims of knowledge management within organization in four main concepts. The first one discusses KM as source of competitive advantage and knowledge is embedded in products and services that make it difficult for competitors to copy. Secondly, KM is claimed as the cause for inter-firm differences in performance. Here the argument is that firms are being rewarded by the market for the intangible asset, knowledge, they have. The third concept elaborates how KM can improve organizational learning (OL) and organizational knowledge base (OKB). The last claim is that KM enables best practice business models and effective knowledge management reflected in improved financial and non-financial

performance. Moreover, managing knowledge means, it is adding or creating value by leveraging know-how, judgment, intuition, and experience resident in or out side of the company (Tiwana, 1999). Further, Tiwana explained the focus of KM with respect to generating new knowledge, using accessible knowledge in making decisions, embedding it in products, services & processes, facilitating knowledge growth, transferring existing knowledge, integrating competitive intelligence and driving strategy. In general term, as knowledge-based industries are growing, the criticality of effective KM within organizations becoming indisputable (Mohd Zin and Egbu, 2010).

2.1.3. Knowledge Management Models (KMMs)

Several KMMs have been developed to address various perspectives of knowledge and knowledge management. In relation to this, some of the major KM Models identified as holistic and critiqued by practitioners such as Dalkir (2005) and Haslinda & Sarinah (2009) are briefly explained here below.

1. Boisot's Knowledge Category Model

The model is developed in 1987 which considers knowledge as either codified or uncodified and diffused or undiffused as represented in matrix of Table 2. The term 'codified' and 'uncodified' related with knowledge attribute in that the former refers to the knowledge that can readily prepare for transmission while the latter is vice versa. The other concept of 'diffused' and 'undiffused' highlights the extent of flow of knowledge within or beyond the organization. Diffused knowledge can freely transmitted in way of codified (eg. Journal, newspapers…etc) or uncodified which is common sense that can be shared through socialization. Undiffused represents intellectual property of the organization or personal knowledge of the individuals.

Table 2: Boisot's Knowledge Category Model.

Haslinda & Sarinah (2009).

Codified	Propriety Knowledge	Public Knowledge
Uncodified	Personal Knowledge	Common Sense
	Un-diffused	**Diffused**

2. Nonaka's Knowledge Management Model

This KM model introduced in the year 1995 by Nonaka & Takuchi and grounded with the basic concept of knowledge with tacit and explicit elements. Tacit is complex knowledge which is developed and internalized by the knower over a long period of time, and difficult to transmit. Explicit knowledge rather easy to record, manage and transmit throughout the organization. Accordingly, Nonaka's model represents four quadrants of highly interactive processes that create knowledge in a way of tacit to explicit or vice versa. By socialization tacit knowledge can be transferred to others as it is while the externalization enables the tacit knowledge to be formalized and transferred to explicit knowledge. On the other hand by translating theory into practice, explicit knowledge can be transferred to tacit through internalization. Besides, by combining various existing theories or practices, knowledge can be transferred from explicit to explicit with the combination process. In general, the whole processes in the four quadrants are iterative and create knowledge spiral that may start at individual level and moves up to the group eventually to the organizational level.

Nonaka's model represented in Table 3 has similarity with the above Boisot's model in that the codified and un-codified concepts have similarity with explicit and tacit knowledge; and both assumes the spread or sharing of knowledge with diffusion or transfer.

Table 3: Nonaka's Knowledge Management Model
Haslinda & Sarinah (2009).

		Tacit	**to**	**Explicit**
	Tacit	Socialization		Externalization
From	**Explicit**	Internalization		Combination

3. Hedlund and Nonaka's Knowledge Management Model

In this model the argument is that complicated knowledge transfer processes cannot be accommodated with simple matrix of Nonaka's KM model; and hence the four levels further categorized based on the carrier or agent of knowledge in organization. Consequently, the carriers categorized into the individual, the group, the organization and the inter-organizational domain. Though the model is supportive as it relates the carriers, it is complicated as shown in below table.

Table 4: Hedlund and Nonaka's Knowledge Management Model.
Haslinda & Sarinah (2009).

	Individual	**Group**	**Organization**	**Inter-Organizational Domain**
Articulated Knowledge	Knowing calculus	Quality Circle's documented analysis of its performance	Organization chart	Supplier's patents and documented practices
Tacit Knowledge	Cross-cultural Negotiation skills	Team coordination in complex work	Corporate Culture	Customer's attitudes to products and expectations

4. The Wiig Model

Wiig model followed the principle that knowledge must be organized depending on "for what use the knowledge will be applied". Accordingly, about four different dimensions were considered; namely, completeness, connectedness, congruency and perspective & purpose. Completeness is about knowing the existence of relevant knowledge in a given source which can be in a form tacit or explicit. Connectedness concerned about the relation between different knowledge objects; hence the more connected knowledge base, the more coherent and greater value. Congruency related with consistency of the prevailing facts, concepts, values, judgments, and associative and relational links between the knowledge objects. The last dimension is concerned about the perspective and purpose for a phenomenon from a particular point of view or for a

specific purpose. Wiig model involves different degree of internalization as depicted in Table 5 and known to be refinement of Nonaka and Takeuchi's Internalization quadrant.

Table 5: Wiig KM Model
Degrees of Internalization. Dalkir (2005)

Level	Type	Description
1	Novice	Barely aware or not aware of the knowledge and how it can be used.
2	Beginner	Knows that the knowledge exists and where to get it but cannot reason with it.
3	Competent	Knows about the knowledge, can use and reason with the knowledge given external knowledge base such as documents and people to help.
4	Expert	Knows the knowledge, holds the knowledge in memory, understands where it applies, reasons with it without any outside help.
5	Master	Internalizes the knowledge fully, has a deep understanding with full integration into values, judgments, and consequences of using that knowledge.

Moreover, Wiig defines forms of knowledge as public knowledge, shared expertise, and personal knowledge and by which more related with Boisot's knowledge category model. In addition, it also defines four types of knowledge as factual, conceptual, expectational and methodological. Consequently, the defined forms and types of knowledge combined to yield KM matrix which is Wiig KM Model as represented in Table 6.

Table 6: The Wiig KM Matrix.
Dalkir (2005)

Form of Knowledge	**Type of Knowledge**			
	Factual	**Conceptual**	**Expectational**	**Methodological**
Public	Measurement, reading	Stability, balance	When supply exceeds demand, price drops	Look for temperatures outside the norm
Shared	Forecast analysis	"Market is hot"	A little water in the mix is okay	Check for past failures
Personal	The "right" color, texture	Company has a good track record	Hunch that the analyst has it wrong	What is the recent trend?

2.1.4. Knowledge Management and ICT

In order to promote effective knowledge management and improve service deliveries, among other factors, the adoption and use of ICT is indisputable (Omona, Weide and Lubega, 2010). The notion of ICT for KM further discussed in Omona et al. paper in that it states that several perspectives of KM share the same core components, namely: People, Process and Technology. With this point of argument the authors tried to show the commonality of Technology (ICT) in effective knowledge management application. In this regard, it has been shown the essence of KM for an organization competitive advantage and the need to understand the knowledge generating activities to be supported with ICT in knowledge-led environment. In similar statements, other researchers and practitioners including Dalkir (2005), Pee & Kankanhalli's (2009) and Kruger & Johnson (2009) stressed the role of ICT as enabler or vehicle for effective KM.

Furthermore, according to Dalkir (2005) the ICT platform not only supports the administration and organization of knowledge resource but also support the interaction among users. To this effect, as shown in Table 7, KM technologies are able to support

KM activities with tools that enhance knowledge creation, sharing, acquisition and application.

Table 7: Major KM Techniques, Tools and Technologies
Dalkir (2005)

Knowledge Creation and Capture Phase	Knowledge Sharing and Dissemination Phase	Knowledge Acquisition and Application Phase
Content creation: • Authoring tools • Templates • Annotations • Data mining • Blogs	**Communication and collaboration technologies:** • Telephone • Fax • Videoconferencing • Chat rooms • Instant messaging • Internet telephony • E-mail • Discussion forums • Groupware • Wikis • Workflow management	**E-learning technologies:** • CBT • WBT • EPSS
Content management: • Metadata tagging • Classification • Archiving • Personal KM	**Networking technologies:** • Intranets • Extranets • Web servers, browsers • Knowledge repository • Portal	**Artificial intelligence technologies:** • Expert systems • DSS • Customization– personalization • Push/pull technologies • Recommender systems • Visualization • Knowledge maps • Intelligent Agents • Automated taxonomy systems • Text analysis— summarization

The study of Kruger & Johnson (2009) also showed that KM is strongly entrenched and rests on the foundation of ICT and IM. To this end, the survey result on South African organizations has indicated that ICT and IM are interrelated prerequisites

and enabler of KM. Moreover, Kruger & Snyman (2005) KM maturity model exhibited the relevance of ICT at each phases of the maturity and emphasized the close correlation between knowledge and ICT management. Consequently, it is determined that with the evolutionary growth in ICT, increased KM maturity would be realized. Nevertheless, ICT is not the only success path to KM and should not be managed as separate entity. Rather, effective KM needs a healthy coexistence of technology, process and people. In line with this statement Pee & Kankanhalli's (2009) General Knowledge Management Model is developed based on the coordinated key process areas of people, process and technology. The technological aspect in this model characterized from the basic IT infrastructure to the complex integrated technology that support organizational knowledge management systems.

2.1.5. Knowledge Management in organizations – an airline industry

Zack (1999) explained the prominence of organizational knowledge and many are struggling to articulate the relationship between their organization's competitive strategy and the intellectual resource/knowledge they have. Dalkir (2005) further elaborated as to how organizational knowledge recognized as a competitive asset. In view of that, KM in organizations is perceived as a variant of three horizons. The first is Business perspective which focused on why, where and to what extent knowledge is exploited. Management perspective is the second domain in which the focus is determining, organizing, directing, facilitating and monitoring knowledge-related activities towards the organizations' strategic objective. The final view is Hands-on perspective at this point the focus is on practical application of explicit knowledge on operational level knowledge-related work or task. In relation, Sajjad (2014) study discussed the concept that a firm's competitive advantage is a function of the knowledge the organization can accumulate over a period of time through defined knowledge processes. Further it indicates that while knowledge for competitive advantage is endorsed by many organizations, still the area needs further research to explore knowledge through processes of knowledge management. To this regard, one of the article on The Economist (2005) supported the idea saying "although most executives would agree that knowledge management is a good idea in principle, it has rarely been treated as a priority." The survey result further depicted that effective

knowledge management depends on capability of capturing quality information from outside as well as within the firm.

Airline industry is known for global business that engaged in highly dynamic business environment, fierce competition and deal with ever changing customer need. Leidner et. al (2006) and Davenport (2000) in their study on the cases of global firms, have pointed out the significance of knowledge management activities in large and geographically dispersed companies in order to be benefited from the opportunities and overcome the challenges. Besides, it is well elaborated that in large global enterprise, where knowledge is noted to be scattered or not managed, it is common to reinvent the wheel by solving same problem from scratch again and again. Jenatabadi (2013) has endorsed the definition of capability as "the integration of a firm's knowledge, skills, routines and ability to create and deliver a product or service that is superior value to their customers". Accordingly, his research findings on sample of 209 airlines demonstrated the intertwined relation of economic performance, capacity and capability of the airlines.

Besides, an MBA research project, conducted by Joseph (2013), disclosed the survey result of 22 Kenya based Aviation Training Institutions to determine the extent of application of knowledge management as a competitive strategy. To this end, the study has concluded the implication of knowledge management with three categories. The first implication is that knowledge management is an important element for sustainable competitive advantage. Secondly, knowledge management helps the organization for smooth implementation of set organizational goals by reducing change resistance. Lastly, knowledge management is noted as the tool to improve performance by assisting the organization to deliver set objectives efficiently.

Moreover, Foon and Eurn (2011) emphasized that the success of airlines depends on how quickly and flexibly airlines respond to changes which basically relies on effective knowledge management. From the survey of Malaysian airline industry and studies of literature, these researchers reached to the conclusion that generic knowledge is necessary to run the industry's daily operations; yet specific knowledge is highly essential particularly for airlines' competitive advantage. Dadashkarimi and Asl (2013)

also conducted survey on ATA Airlines and exhibited the significance relation between knowledge management strategies and organization performance.

2.1.6. Maturity Models

A case study of Pee and Kankanhalli (2009) describes maturity model as the development of an entity over time and characterized by: simplified and described with a limited number of levels (usually four to six), levels are ordered sequentially along with the requirements that the entity must achieve and the levels progress leaps without skipping any level. As described by Salah et al. (2014) maturity models represent how organizational capabilities evolve in a stage-by-stage manner along an anticipated, desired, or logical maturation path. Thus, the use of a maturity model allows an organization to have its methods and processes assessed according to the acceptable best practice and/or benchmarks. Maturity models are useful frameworks in order to move the organizations to the higher level of maturity, KM readiness and desired transparency (Dalkir, 2005).

Maturity models have been developed to serve for the assessment of different processes and activities including IS. Accordingly, Nolan developed six staged growth model for IT systems in 1970 (Hollyhead, 2012). Capability Maturity Model (CMM) is also developed for the purpose to guide software engineering and management process with five level evolutions and regarded as standard for defining software process quality (Pee and Kankanhalli, 2009). Further, for the purpose of IT Governance, Information Systems Audit and Control Association (ISACA) developed COBIT maturity model with 6 stages from non-existent to optimize by integrating CMM.

2.1.7. Knowledge Management Maturity Models (KMMM)

Knowledge management measures has to be focused on factors that affect the ability to achieve strategic objectives and hence the enterprise knowledge management needs must be understood clearly (Smits and Moor, 2003). According to Smits and Moor, benefits of knowledge management measuring include:

- True reflection of the actual worth of the company

- Gaining insights into the diverse of sustainable performance
- Effective governance of social and environmental
- Protection and growth of assets that reflect value
- Supporting a corporate goal of enhancing shareholder value
- Provision of more useful information to existing and potential investors

As a result, different scholars have developed several KMMMs and utilized by different researchers of the field. Though these KMMMs are developed based on different assumptions, they commonly share the concepts of sequence of stages and general sequence of entity development in life cycle theory (Pee and Kankanhalli, 2009). It is also recommended that KMMM should provide a systematic and structured procedure to ensure the transparency and reliability of assessment. Pee and Kankanhalli indicated CMM-based KMMMs as listed in the table below.

Table 8: CMM-based KMMMs.
Pee and Kankanhalli indicated (2009).

Level	**CMM**	**CMM-based KMMMs**			
		Siemens' KMMM	**KPQM**	**Infosys' KMMM**	**KMCA**
0					Difficult/Not possible
1	Initial	Initial	Initial	Default	Possible
2	Repeatable	Repeatable	Aware	Reactive	Encouraged
3	Defined	Defined	Established	Aware	Enabled/practiced
4	Managed	Managed	Quantitatively managed	Convinced	Managed
5	Optimizing	Optimizing	Optimizing	Sharing	Continuously Improving

Moreover, the study described KMMMs of KPMG Consulting, TATA Consultancy 5iKM3, Klimko's and Wisdom Source's K3M are among the KMMMs identified as Non-CMM and discussed the critiques on each of them. Further, Pee and Kankanhalli developed 5 staged KMMM which is known as General Knowledge Management Maturity Model (G-KMMM); depicted in below Table 9. This KMMM is

basically developed on holistic assessment taking people, process and technology as key process areas. In order to facilitate the validation and practical application, they also developed assessment instrument by categorizing in to key process areas of people, process and technology. The model was tested with one public university focusing on "computer hub" taking several units of the organization. To this effect, the study recommends future work to examine on various large scale industries and to make the model incorporate other situational factors of knowledge management maturity.

Table 9: Proposed G-KMMM.
Pee and Kankanhalli (2009).

Maturity Level		General Description	Key Process Areas		
			People	Process	Technology
1	Initial	Little or no intention to formally manage organizational knowledge	Organization and its people are not aware of the need to formally manage its knowledge resources	No formal processes to capture, share and reuse organizational knowledge	No specific KM technology or infrastructure in place
2	Aware	Organization is aware of and has the intention to manage its organizational knowledge, but it might not know how to do so	Management is aware of the need for formal KM	Knowledge indispensable for performing routine task is documented	Pilot KM projects are initiated (not necessarily by management)
3	Defined	Organization has put in place a basic infrastructure to support KM	- Management is aware of its role in encouraging KM - Basic training on KM are provided (e.g., awareness courses) - Basic KM strategy is put in place - Individual KM roles are defined - Incentive systems are in place	- Processes for content and information management is formalized - Metrics are used tomeasure the increase in productivity due to KM	- Basic KM Infrastructure in place (e.g., single point of access) - Some enterprise level KM projects are put in place
4	Managed	KM initiatives are well stablished in the organization	- Common strategy and standardized approaches towards KM - KM is incorporated into the overall organizational strategy - More advanced KM training	Quantitative measurement of KM processes (i.e., use of metrics)	- Enterprise-wide KM systems are fully in place - Usage of KM systems is at a reasonable level - Seamless integration of technology with

Maturity Level		General Description	Key Process Areas		
			People	Process	Technology
			- Organizational standards		Content architecture
5	Optimizing	- KM is deeply integrated into the organization and is continually improved upon - It is an automatic component in any organizational processes	Culture of sharing is institutionalized	- KM processes are constantly reviewed and improved upon - Existing KM processes can be easily adapted to meet new business requirements - KM procedures are an integral part of the organization	Existing KM infrastructure is continually improved upon

Grundstein (2008) developed a Model for General Knowledge Management within the Enterprise (MGKME) based on sociotechnical approach – focusing on people and value adding processes. This model uses the underlying concepts of several models such as COBIT IT Governance maturity model, Deming's Quality Management cycles of Plan-Do-Check-Act and SECI model of Nonaka and Takeuchi as input. In addition, Hylton (2008) attempted to measure knowledge management with Readiness Assessment branded as ©Kekma-Audit which basically consider a minimum of three levels. The first level, Stage 1, is Readiness Assessment at the initial stage then go up to Stage 2 level which assess the training and preparation and finally Stage 3 which tests pilot areas with knowledge audit. It is argued that these levels of measures would help the company to determine: the current readiness state, the desired readiness state, the readiness gap state (difference between current and desired), the true readiness state (what is perceived and really is) and the necessary action.

A Strategic KMMM is developed by Kruger and Snyman (2005) with the objective to address the limitations of other models by considering strategic business issues related to knowledge management. In line with this, the researchers criticized other models for expending too much effort to address technological concerns, vague for practical application and/or not enough emphasis for culture and other management issues. The study supported with literature to show other researchers consensus on the idea as a whole and ICT's enabling role in knowledge management.

Kruger and Snyman have discussed organization's ICT management with four eras. The first one is Operational Support which is primarily designed to support business operations. Second era is Support for management and knowledge work which go further to support management and knowledge workers. Thirdly comes the era of Support of business transformation and competition at which stage organizations rely on ICT for their competitive advantage and for knowledgeable decision making. The last era is Ubiquitous computing at which ICT goes beyond its organizational boarders. Hence, knowledge is the ultimate strategic resource for the organization and it is difficult

to manage knowledge and ICT separately; rather they are interrelated to constructively progress. Thus, in order to say knowledge is properly managed, an organization should able to manage both ICT and knowledge simultaneously. It is also advocated that organizations must progress to the maximum edge to manage knowledge as strategic resource. With this respect, it is reasoned that knowledge management maturity should focus on enabling the organization to make aware of what they want, how to create, efforts needed and keeping focused towards business strategy. To this effect, a strategic knowledge management maturity model, which claimed to be built on the progression and institutionalization of knowledge, is developed.

Kruger and Snyman Strategic KMMM is established on the common four stages (Initial, Aware, Manage and Optimize) with further qualification of six phases of strategic perspective as shown in Figure 2. These six phases are: ICT as enabler of knowledge management, decide on KM principles, the ability to formulate an organization-wide knowledge policy, building knowledge strategy/strategies, formulation of knowledge management strategies and Ubiquitous knowledge.

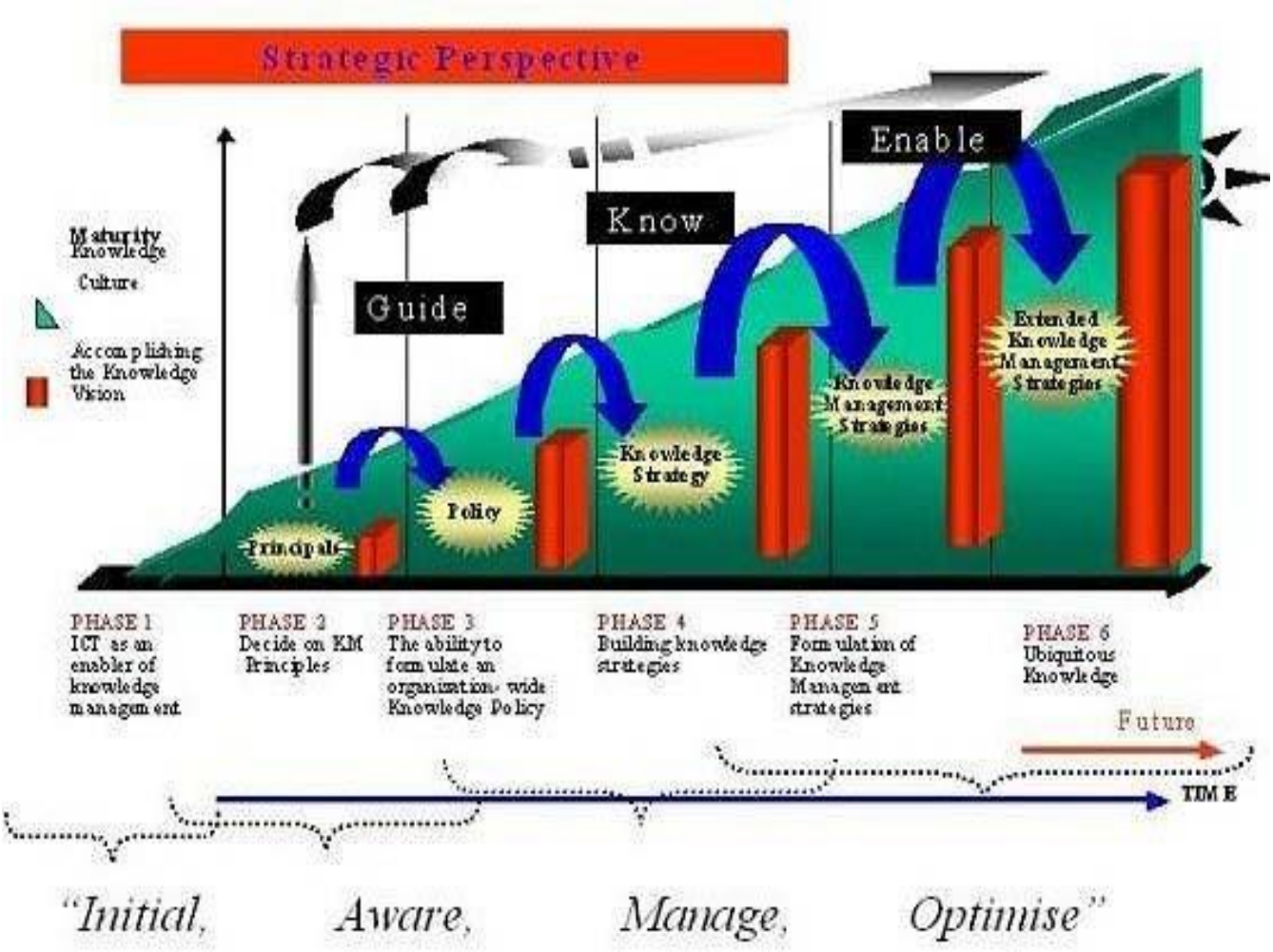

Figure 2: Strategic Knowledge Management Maturity Model. Kruger and Snyman (2005).

Phase 1: ICT as an enabler of Knowledge Management

This phase is characterized by factors that organizations are not aware of about the power of knowledge as strategic resource. To this effect, ICT (if it exist) is not managed effectively and efficiently to serve KM; rather serves to merely process/handle mere data and information. Moreover, knowledge resides in the minds of the "knower" and there is no way of defined sharing instead practiced in informal manner.

Phase 2: Decide on Knowledge Management Principles

In phase 2 organizations recognizes the importance of KM as formal function, and efforts noted to synthesize the realization at all levels in the organization. Besides, the organization realizes ICT's application further to the data and information systems.

Moreover, organizations realize the necessity of endeavor to formulate knowledge vision or future state of knowledge.

Phase 3: The ability to formulate an organization-wide knowledge policy

This phase is known for the formulation of knowledge policy which guides how the organization is going to manage, secure and protect knowledge (both tacit and explicit) as strategic resource. ICT in this phase progresses to the level capable of supporting management's decision and knowledge work. Moreover, the organizations effort to establish knowledge management function, knowledge domains, as well as forums, with governing guidelines.

Phase 4: Building Knowledge Strategy/Strategies

At this level of maturity the organizations have determined their knowledge resources (both tacit and explicit), where resides (internal and external) and why strategic. Moreover, there exists effective and efficient ICT architecture to support knowledge management. At this stage business strategies are formulated based on knowledgeable reasoning.

Phase 5: Formulation of Knowledge Management Strategies

At 5^{th} phase, the organization is capable to formulate effective plan to change the knowledge and ICT structure from 'as-is' to the required 'should be' structure. Accordingly, the interdependencies between ICT and Knowledge Management to sustain competitive advantage is well recognized. Thus, Knowledge and ICT institutionalized to enable the organization to explore, create, acquire, transfer, capture, codify, share and distribute knowledge efficiently.

Phase 6: Ubiquitous Knowledge

Phase 6 is the highest level in the maturity ladder at which knowledge management integrates seamlessly with customers, business partners/alliances and vendors. To this effect, the ICT in such environment is borderless and capable to share knowledge and experts among stakeholders in the value chain. Furthermore, the concern here is to institutionalize knowledge management between partners rather than focusing on specific organization as in phase 5.

In general, Kruger (2005) concluded that knowledge to be proven that it is sufficiently managed; organizations must progress to a point where they are able to manage ICT, information and knowledge simultaneously.

In line with the above mentioned KMMM, Kruger and Snyman (2007) have developed a guideline to assess organization's knowledge management maturity. Moreover, Kruger (2008) in his PHD dissertation have somewhat modified the model without making fundamental changes on the progressive levels as shown in Figure 3. Some naming differences are noted with the intention to emphasize on the growth of interrelated KM and ICT within the organization's process. For instance, Phase 4 (the previous Building Knowledge strategies and here Formulating Knowledge Management Strategies) manifested in a way that recognizing knowledge as strategic resource and formulate knowledge as well as knowledge management strategies. Phase 5 (previously identified as Formulation of knowledge management strategies and now labeled as Implementation of knowledge management strategies) is about KM implementation based on the formulated KM strategy of the 4th phase. At this level strategists start to perceive ICT, information management and knowledge management as interdependent entities, and critical for sustainable competitive advantage. To this effect, the models are not exclusively different rather one is built upon the other and more elaborated.

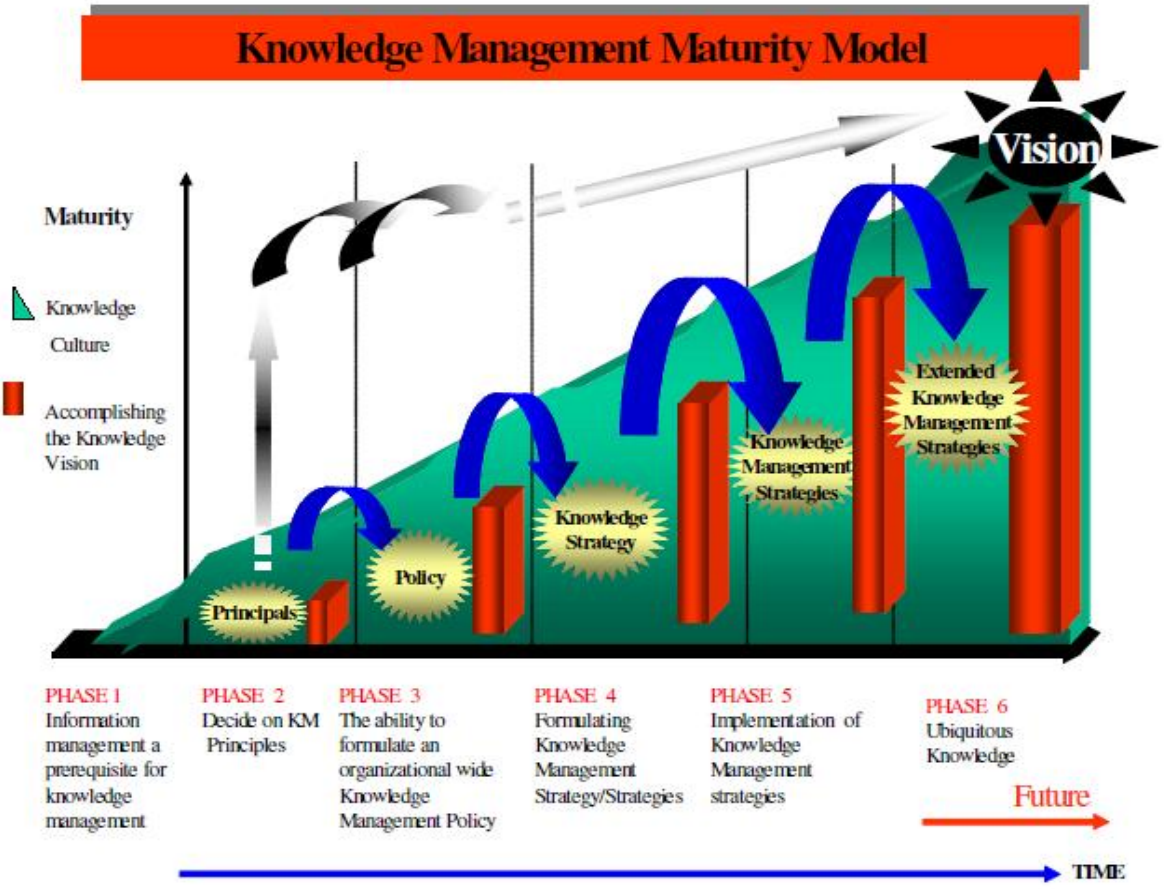

Figure 3: Kruger's (2008) KMMM

Kruger and Snyman (2007) assessment guideline includes a questionnaire consisting of six sections (which correspond to each of the six phases), containing 104 descriptive questions. The six sections of the questionnaire classified as ICT Management, Information Management, Formulation of Knowledge Management principles, policy and strategy, Implementation of Knowledge Management, Ubiquitous Knowledge and Assessment of Knowledge Management Growth. The questionnaire claimed as tested and validated by a number of scholars in the field of knowledge management. To this end, Kruger's (2008) model is designed to be aligned with the assessment guidelines and the corresponding questionnaire.

2.2. Related works

As the importance of knowledge management within organizations growing, different researchers have tried to measure KM maturity levels of several areas. To this regard, some researchers' works were reviewed as presented below and summarized in Table 10.

A research on selected South African Industries was conducted by Kruger and Johnson (2009) to evaluate growth in knowledge management maturity over the past five years. Kruger and snyman's (2005) model was considered along with the last section of the corresponding questionnaire of Kruger & Snyman (2007) which is "assessment of knowledge management growth". The evaluation result had been categorized by industry groupings (construction, bank, government, education…etc), organization size (small, medium, large and extra-large) and managerial levels (operational, middle and senior). Accordingly, the study forwarded its findings with respect to each category as well as holistic growth.

The findings disclosed that South African industries are better in KM and struggle with extending KM beyond their borders (Ubiquitous knowledge). It is indicated that KM is institutionalized in South African industries and most of the organizations have indicated growth in KM over five years. However, this does not mean there is consistent growth within the category; rather statistical differences were noted on scores at each category of the evaluation. Assessment viewed holistically with a domain that there could be a "breakeven point" between resources available and KM growth. But the influence of organizational size and the availability of resources are not keys for successful KM implementation. Rather, KM noted to be dependent on a deliberate, conscious and calculated managerial effort than on factors such as organizational size and the competing industries. In this regard, the researchers' analysis and their conclusion pointed out that middle management (with the support of senior management) holds the key for successful growth of KM. Yet, the study is limited to KM growth and hence the other maturity levels specified in the model were not assessed. Moreover, the study is concluded by identifying factors for successful KM implementation rather than clearly showing at what maturity level the industries are. Accordingly, taking this as "pilot study" future work is recommended with additional industries inclusion and comprehensive assessment of KM maturity at all levels.

On another area of study, construction industry, Mohd Zin and Egbu (2010) have conducted research to measure readiness of the organizations to implement knowledge

management strategy. KM readiness assessment presented in this study as a measure of the degree to which an organization may be prepared or willing to obtain benefits which arise from KM implementation. It is also underlined that KM implementation is not an easy task in which a number of things must be considered and prepared in advance. Hence, organizations need to assess whether their organizations are readily equipped before embarking on KM programs.

Accordingly, Malaysian construction industry is assessed for KM implementation readiness focusing on people, process and technology. The research finding described with three main challenges. The first challenge is people-related as attitudes and habits which are mainly related to the difficulty with recruiting and retaining high quality people. The second is the difficulty to have the right resources and allocation to the right purpose. Close monitoring and tracking budgets & plans upon execution mentioned as the third challenge. As a result the research able to identify factors those are challenging to the Malaysian construction industry and recommended a solution for future endeavor. Major factors such as culture, role of technology, top management support, role of human resources, organizational structure and leadership are mentioned as the basis to be addressed for Malaysian construction industry. To this effect, the recommendations forwarded to the construction industry to work on KM policies, budget actions, organizational structures, attitudes and habits. In general, a series of KM initiatives are advised to ensure that the organization to abreast with the competition. However, the study didn't use any model to measure the KM for the case organization and difficult to be aware of what KM initiatives are already exist and the desire to where it progresses; rather conclude the assessment result based on literature review.

Foon and Eurn (2011) have conducted a research in the Malaysian Airline Industry with the aim to analyze the current use of KM in the airline and provide a strategy for future better use. In this study it is thoroughly discussed the criticality of knowledge for the current competitive and unprecedented business environment like Airline Industry. It is also indicated that the research has been done based on literatures review and presented how KM can bring competitive advantage for the airline. Besides, the study streamlined to focus on four constructs; namely ICT, organizational learning, intellectual capital and knowledge sharing to assess the KM initiatives in airline industry. ICT is applied for assessment due to the acceptance of its enabling factor in effective KM. The second focus, Organizational learning, is taken to evaluate the

conscious effort of the organization in implementation of KM. Then intellectual capital considered recognizing knowledge comprising human resources (skill, know-how, competence), stakeholder relationships (customers, suppliers, partners, government) and organizational resources (systems, processes, corporate culture, management style, intellectual property, brands). The last, Knowledge sharing is noted as crucial to ascertain existing knowledge identification and accessibility to solve problems.

Accordingly, the researchers analyzed Malaysian airlines current KM practices with respect to these four pillars. Thus, modern airline ICT solutions such as CRS and ERP as well as KM technologies like collaboration tools, BI and content management are noted in Malaysian airlines. Taking the organizational learning with three elements integration (people, process and technology), the airlines are learning to cope with the market expansion and cost efficiency. With respect to intellectual capital, it is stated in the research that the Malaysian airlines are set to train as to create innovative and team-oriented employees. Maintaining favorable relationships with business partners is paramount and brand is the airlines' valuable asset. Finally, the airlines knowledge sharing culture assessed and stated that sharing exist both internally and externally as the business nature forced same to operate in code sharing and inter-linking. Moreover, KM initiatives such as to build communication culture, informal team and whistle-blowing policy mentioned as knowledge sharing facilitators. Yet, the study concluded that airlines should progress beyond the industry's current state of KM. To this end it is recommended that the need to further build up on the KM tools and techniques such as knowledge sharing and transfer, ICT, Organization Learning and assigning knowledge experts like Chief Knowledge Officer (CKO) so as to cope up with the expanding business. But, the research didn't use any model to measure the KM in the airlines and hence difficult to objectively know the level where currently is and move to where.

Wijetunge (2012) carried out an assessment of knowledge management maturity in a university library of Sri Lanka. The researcher had selected the Library for the reason it is claimed as volatile which need strategic KM and measuring KM Maturity is a prerequisite for successful KM implementation. Kruger's 2008 model was used for classification into phases and approached the assessment of the KM maturity level at the organization level as a whole and at managerial level. Accordingly, the researcher's findings have shown the case Library has

entered in phase II since the analysis exhibited that ICT evolved to data and information systems and the importance of knowledge is realized. It is also indicated that the Library is ready to move into phase III provided that the forwarded recommendations are implemented to fill the gaps. As a result, it is recommended that the Library formulates KM and Information Management (IM) policy, appoint senior staff to coordinate KM initiatives strategically, educate and train all staff to raise general awareness on KM and evaluate ICT to improve current tools and services to the level capable to suit for the KM initiatives. Nevertheless, this study lacks comprehensiveness as it didn't incorporate all stakeholders' perceptions and limited to library staffs survey results. Moreover, even if the research methodology stated as both quantitative and qualitative using Kruger and Snyman instrument, only the quantitative results are clearly analyzed and presented.

Hermella (2013) has conducted her MSc. thesis on KM Maturity assessment in Development Aid Organizations in Ethiopia (non-profit industry). The primary objective of this study was stated as to assess KM maturity in non-profit organizations and provide an insight for development of a concise baseline. The researcher has used Kruger and Synman knowledge management maturity measurement instrument and Pee & Kankanhalli's GKMMM. It is justified in the study that the data collection instrument is pre-tested and validated with knowledge management experts. The research also showed the importance of KM in non-profit organizations, identifies areas to improve and propose solutions. Accordingly, findings are summarized with the indication of the existence of several KM initiatives, mainly on knowledge sharing, and presented with instances such as: availability of ICT infrastructure to facilitate KM initiatives, well understanding of the KM importance, working knowledge/information sharing system, active involvement in knowledge sharing practices…etc.

Eventually, the research concluded that the organizations under the study fall under third maturity level which is 'Defined'. Consequently, corresponding recommendations were forwarded to enhance knowledge sharing and in the long run to leverage organizational knowledge within strategic directions. To this end, recommendations like the need to initiate training, establish virtual communities of practices, build knowledge sharing environment, make knowledge accessible, strengthen units of KM in organizations and put proper organizational guide & tool were suggested. Nevertheless, it is indicated that the research is not all-inclusive to

cover facets of KM since the focus is on knowledge sharing and proposed future work in this regard. Moreover, though the research stated Kruger and Snyman instrument, it didn't clearly show how the survey results interpreted into the phased model of GKMMM and as to how the maturity level determined to be 'Defined'.

A research with an objective to explore the nature and types of knowledge gaps was conducted by Sajjad (2014). The study conducted with a processual approach which follows a processes analysis with a focus on the unfolding of events in retrospective and real time. In order to apply processual approach and hence to explore the underlying processes, the researcher used secondary data of the case study companies and conducted three phased structured interview. Consequently, the analysis results formalized with findings that the need to determine organizational knowledge gap taxonomy, source of knowledge gaps and factors to fill those gaps. Thus, the new taxonomy of organizational knowledge gap with five categories (namely, physical capital, intellectual capital, relationship management, social capital and cultural capital) is introduced. With respect to factors to knowledge gaps, exogenous and endogenous factors are identified. Exogenous related with external factors which includes changes in government policies and regulations, competitive forces and industry specific changes. To this effect, the knowledge of exogenous nature is categorized as imposed knowledge gaps as it emerges from external environment and hence difficult to fill easily. On the other hand, endogenous factors related with changes in internal organizational structure and processes; thus it includes changes in companies' existing repositories of knowledge, strategic direction, management intentions, and existing capabilities and competencies. Thus, endogenous knowledge is identified as strategic and relatively easy to fill. Further, the researcher forwarded his recommendations on knowledge gaps at the case companies by stating the need to invest time, resource and energy to ensure readiness and appropriate knowledge are acquired & internalized. The study specified its limitation on reliability of the data collected though processual approach is to explore events retrospectively. To this end, further research is recommended to enable organizations to have effective knowledge management strategies.

Table 10: Summary of Related Works

Author, Year & Title	Objective	Model used/Approaches/Methodologies	Key Findings	Recommendation & Future Work	Remark/Comment
Haider Sajjad (2014) Identification, emergence and filling of organizational knowledge gap: a retrospective processual analysis	To explore the nature and types of knowledge gaps, to capture their change and to light on the process of filling knowledge gaps	Processual Approach with secondary data source and three phased interview.	• Proposed new knowledge gap taxonomy with five categories. • Identified factors to knowledge gaps as exogenous and endogenous • The difficulty to fill exogenous or imposed knowledge gap over endogenous is identified	• The need to invest on time, resource and energy are recommended to fill the identified knowledge gaps. • Further research recommended to investigate companies based on processual approach with reliable data and to formulate knowledge management strategies.	• The approach (Processual) is difficult to trace back evidences retrospectively and validate the event. • The study didn't indicate the KM maturity level of the case companies and to what level the recommendations expected to take it.
Hermella Ayalew (2013) Knowledge Management Maturity Assessment in Development Aid Organizations in Ethiopia	To assess KM maturity in non-profit organizations and provide an insight for development of a concise baseline	Pee & Kankanhalli GKMMM as measurement model and Kruger & Snyman questionnaire as data collection instrument	• Identified existence of several KM initiatives • Noted indications of readiness for higher level of KM • Organizations under the study fall under third level of maturity – 'Defined'	Recommended on: • Training • Virtual communities of practice, e-discussions, meetings …etc. • Knowledge accessibility • Strengthening and financing units of knowledge management • Proper organizational guide, tool,	• The study is not comprehensive as it focused on knowledge sharing. • Not clearly presented how the models interlinked and how results were interpreted to measure the case KM maturity level.

Author, Year & Title	Objective	Model used/Approaches/Methodologies	Key Findings	Recommendation & Future Work	Remark/Comment
Pradeepa Wijetunge (2012) Assessing Knowledge Management Maturity level of a university library: a case study from Sri Lanka	To assess the knowledge management maturity in a university library of Sri Lanka	Kruger's 2008 KMMM and Kruger & Snyman data collection instrument (questionnaire) is used.	According to the model classification, the university Library of Sri Lank is at phase II and ready to move to phase IIII.	• Formulation of policy and strategy • Education and training on KM • ICT infrastructure improvement **and** Full implementation plan as future work	• The study didn't incorporate all stakeholders' perceptions. • Though the methodology initially declared as quantitative and qualitative – it is not completely analyzed – the focus is only on quantitative.
Rain Low Swee Foon and Lum Soo Eurn (2011) Application of Knowledge Management in the Malaysian Airline Industry: A Critical Review	To analyze current use of knowledge management in the Malaysian airline industry and to provide a strategy for future use of knowledge management	Literatures review and industry analysis	There are considerable initiatives regarding ICT, organizational learning, intellectual capital and knowledge sharing. But the level is remarked as not the industry standard.	Strategy to: • Improve ICT • Develop Organizational learning • Assign dedicated CKO • Consider knowledge transfer department and corresponding infrastructure	• No model is applied for KM evaluation. • Difficult to identify the KM maturity level of the case airlines.

Author, Year & Title	Objective	Model used/Approaches/Methodologies	Key Findings	Recommendation & Future Work	Remark/Comment
Mohd Zin I. N. and Egbu C.(2010) Readiness of Organization to Implement a Knowledge Management Strategy: A Construction Industry Overview	To identify issue worth considerations to determine an organization's readiness level.	Literatures review and organizational analysis/lessons learned.	Three main challenges identified: • People related (attitudes and habits) • Right resources and allocation to the right purposes. • Close monitoring and tracking of budgets/ plans	Range of initiatives related to KM are recommended including: • Policies • Budget actions • Organizational Structure Exploration of detailed requirements is recommended for further KM readiness assessment framework.	• No model is applied for readiness assessment. • Difficult to identify the KM maturity level of the case organization.
C.J. Kruger and Roy D. Johnson (2009) Assessment of Knowledge Management's Growth in South Africa	To assess growth in KM maturity over a five years period.	Kruger & Snyman (2005) model with Kruger & Snyman (2007) questionnaire.	Identified: • Well institutionalized KM in South African industries • Growth in KM maturity over five years • Organization size and resource are not key for KM as compared with managerial effort.	Further research recommended for the inclusion of additional industries and comprehensiveness to assess all level of KM maturity in the industries category.	The study: • Is limited to evaluate KM growth (last maturity measure). • Focus on identifying factors for successful KM and not conclude on the maturity level

Hylton (2008) as a knowledge management practitioner emphasized the criticality of KM Readiness Assessment for effective and efficient knowledge management implementation. Readiness Assessment in KM argued for its advantage of answering basic questions before launching any initiatives; “how ready the organization is?”, “ do organization has all that needed to make the initiative happen successfully?” or “what do we need to do to be better ready, better prepared?”. Several literatures including (Smits & Moore, 2003; Dalkir, 2005; Kruger and Snyman 2005; Kruger & Johnson, 2009) advocated same idea and exhibited with practical researches. To this effect, measuring knowledge management maturity level taking the case of Ethiopian Airlines would contribute to identify the organization’s gaps and expected actions.

CHAPTER III

RESEARCH METHODOLGY

3.1. Research design

This research has made efforts to address initially coined objective of measuring knowledge management maturity level in EAL by determining whether it is at the initial (non-existent) stage or KM exists at awareness level or has been managed to be integrated into the process or highly developed to a stage of optimum level. Furthermore, in an effort to make the KM maturity measure more comprehensive, the evaluation was done with constructs of the organization's ICT, KM Principles, policy & strategy and Pervasive knowledge.

3.1.1. Research strategy

In this research, both quantitative and qualitative approaches have been applied to collect and analyze data. It is the researcher's belief that in applying both approaches for data collection, the study analysis has benefited from representative input including detail feedbacks of interviews. The quantitative approach helped the research to conduct a survey by reaching reasonably large respondents through questionnaire with optimized time. Besides, this approach found to be easy for analysis and presentation. On the other hand, qualitative approach has also been considered by conducting interview to explore focus groups attitudes, behavior and experiences. Accordingly, with in-depth discussions, the qualitative data output (interview result) was used to better apprehend initiatives, conditions and challenges for EAL KM practices. In addition, secondary sources were consulted with the aim to discuss results of survey and/or interview analysis.

3.1.2. Research model

Different literatures have been reviewed to formulate the conceptual foundation for KM maturity and select the applicable model. Accordingly, in this research, Kruger's (2008) model has been selected and applied to determine the KM maturity level of EAL. The model has identified broader four levels of KM maturity **(initial, aware, manage and optimize),** which is mapped into detailed six phases as depicted in figure 2.

The six phases include:

Phase 1: ICT as an enabler of Knowledge Management

Phase 2: Decide on Knowledge Management Principles

Phase 3: The ability to formulate an organization-wide knowledge policy

Phase 4: Formulating Knowledge Management Strategy/Strategies

Phase 5: Implementation of Knowledge Management Strategies

Phase 6: Ubiquitous Knowledge

This model is a refinement over the previous Kruger & Snyman (2005) KMM model to make more comprehensive and aligned with the guidelines for evaluating knowledge management maturity. Furthermore, the model is selected due to its holistic design to address knowledge maturity from a strategic point of view, tested and applied by different researchers (Kruger & Snyman, 2007; Kruger & Johnson, 2009; Wijetunge, 2012). Besides, this model can be taken as complete as it includes guidelines to measure knowledge management maturity with standard questionnaire.

3.1.3. Target population

EAL has more than 8,000 employees including staff at outstation international locations. But this study has taken employees at Head Quarter by focusing on office based workers as target population not only for a reason of manageability but also for the reasons:

- ✓ All city, regional and outstation offices are being managed and controlled centrally from Head Quarter
- ✓ Flying crews and operational staff are represented by their support back office workers at Head Quarter
- ✓ Majority of employees including executives, who have key roles for establishment of effective KM within the organization, are positioned at Head Quarter
- ✓ Staff with relevant knowledge management practices including ICT usage are located at Head Quarter

Accordingly, the target population is determined to be 1,318 in number.

In addition, secondary documents such as strategic road map, standard operating manuals, policies and procedures have been used in support of assessing the business environment and existing infrastructure with respect to the KM practices.

3.1.4. Sampling techniques

In this research stratified systematic sampling is used for the quantitative analysis. Stratum has been applied over the target population based on positions with proportional allocation in order to get representative sample both from management and non-management employees. This approach is selected for the reasons of bias reduction and simplicity. On the other hand, purposive sampling is used to select interviewees for qualitative data analysis. Through purposive sampling, the researcher picked key informants easily and quickly with especial intention of reaching executives and/or senior management. Therefore, both stratified systematic sampling and purposive sampling techniques were applied to get representative sample from the target population.

3.1.5. Sample size

Among the target population of 1,318, it is identified that 14% (178) is management group while the remaining 86% (1,140) is non-management staff. Subsequently, taking the total target population size (N) of 1,318, the sample size for quantitative analysis (questionnaire) is determined to be 65 applying the formula in Appendix 4 with confidence level of 90%.

Once a sample size determined as 65 in number, the proportionate value of management and non-management was computed using the aforementioned percentage values (14% and 86%). Thus, at a minimum a sample of 9 and 56 were determined to be taken as number of staff required to participate in responding the questionnaire from management and non-management respectively.

On the other hand, the concept of theoretical saturation has been applied to determine the sample size for qualitative analysis (interview). Theoretical saturation is the phase of qualitative data analysis in which the researcher has continued sampling and analyzing data until no new data appear. This process requires a flexible approach to data

collection as it progresses alongside data analysis. Accordingly, the researcher has selected 5 interviewees in a sequence with subjective judgment. These interviewees were purposefully selected from high level executives who believed to have say in effective KM establishment and conversant with the concept. In line with this, the interview input analysis has indicated saturation with the feedback as the replies of 5 of the interviewees were consistent to one another. To this effect, the sample size has been found to be sufficient to serve for detailed discussion and no need to add more samples.

3.2. Data collection instrument

Kruger's (2007) standard questionnaire is adopted to collect input data for quantitative analysis. This questionnaire has been developed as a guideline for assessing knowledge management and it is found to be in line with the Kruger's KM Maturity model. In addition, it is comprehensive in its coverage of the technology, people, process, organizational structure and strategy perspectives. In this regard, several researchers acknowledged the practicability of this data collection instrument and applied it in their studies (Kruger and Johnson, 2009; Wijetunge, 2012; Hermella, 2013). To avoid misinterpretation, in this specific study, the term "organization" in the original questionnaire has been changed to "EAL". In addition, Information Management and Knowledge Management definitions were provided along to avoid confusion of terms. Subsequently, a semi-structured interview questions outline was also derived from this standard questionnaire and used for qualitative data analysis.

3.3. Data collection procedure

3.3.1. Data collection method

The questionnaire was distributed to 100 selected individuals in hard copy and hand delivered personally. The distribution has been made to the greater number than the determined sample size in order to secure reasonably adequate responses and increase precision. Besides, hand delivery of the questionnaire was chosen to increase response rate and get opportunity to clarify matters face to face. In addition, in order to reach to common understanding on the subject matter, the researcher has given respondents a brief explanation on the subject matter (KM) and the objective of the study by arranging group session or individually, as convenient. Further, telephone and random visit were

used to encourage participants to respond and address queries, if any. Thus, a total of 90 participants have responded to this survey from the selected 100 individuals.

On the other hand, one-to-one interview has been conducted with 5 selected executive and senior management staff. Most of the interviews were pre-scheduled and conducted at off hours which have created convenience to make in-depth discussion. Moreover, before getting into the interview, the researcher has provided explanation on the subject matter, regarding the purpose and the time the interview might take. In effect, the interview has taken up an average duration of 30-45 minutes per interviewee.

3.3.2. Data preprocessing method

The questionnaire data has been fully captured into the pre-formatted template by the researcher in order to minimize error and ensure completeness. Furthermore, the data has been cleansed and edited for its information completeness and logical coherence. To this end, the researcher managed to make complete some questionnaires requiring few clarifications from respondents end or the researcher as well. Nevertheless, out of the total 90 responded questionnaire, 11 of them were found to be totally with unacceptable quality and discarded from the analysis.

Besides, the interview notes have been transcribed individually with organized statements and forwarded to the interviewees for concurrence of its accuracy. Accordingly, out of the 5 interviewees, 4 of them have given confirmation while the remaining 1 did not reply to the query. Finally, the data theme is identified with open coding and presented in narration.

3.4. Data analysis and presentation method

Kruger's standard questionnaire primarily utilized a four-point Likert scale with labels "***Yes definitely, Yes but not Significantly, No but probably within the next 5 years and No***" that allows to assign number to express the degree of maturity with values or percentage. As a result, the quantitative data collected through this standard questionnaire were assigned numeric values based on Kruger's recommended limits and captured with pre-defined format. In this regard, each sections of the questionnaire were assigned a maximum numeric value as per Kruger's

recommendation. Accordingly, the following value assignments were established to respective sections regressively.

Table 11: Likert Scale Score Assignment

Section	Likert Scale			
	***Y**es definitely **(Y)** *100%*	Yes but not **S**ignificantly **(S)** *70%*	No but **P**robably within the next 5 years **(P)** *40%*	**N**o **(N)** *0%*
1. ICT Management	20	14	8	0
2. Information Management	76	53	30	0
3. Formulation of Knowledge Management Principles, Policy and Strategy	88	62	35	0
4. Implementation of Knowledge Management	94	66	38	0
5. Ubiquitous Knowledge	76	53	30	
6. Assessment of Knowledge Management Growth	4	3	2	0
Total Max score points	**358**	**251**	**143**	**0**

***Kruger's recommended max score**

The pre-defined format has been prepared using Microsoft Excel (2010) to capture the responses and for subsequent interpretation into equivalent numerical values. The format was designed with distinct sheets for each section (6 sections) of the questionnaire to simplify the analysis and evaluation over each section. Accordingly, each of the respondents' replies for each item of the questionnaire has been captured into the corresponding section of the format. Then, each section's values were analyzed separately to generate the percentage achieved basing the maximum score expected for that specific section. Correspondingly, graphs and tables were also created based on the analysis result and excel served as a tool. Finally, the analysis results (including graphical and tabulated ones) have been interpreted to associate with the research findings and objective.

On the other hand, the qualitative data of the interview result were presented fully in description and tried to get linked with the quantitative data for proper interpretation. In addition, related works of the literature review, observation and secondary documents were used to support the findings.

CHAPTER IV

ANALYSIS AND DISCUSSION

The general aim of this research has been clearly defined from the outset with an objective to determine EAL's KM maturity level and forward the corresponding recommendation on improvement areas. Accordingly, this study has attempted to answer initially formulated research questions including but not limited to how ICT, KM principles, policy & strategy in EAL support KM and the extent of KM implementation in the organization. To this end, the responses both from questionnaire survey and interview were analyzed in line with the research questions to provide insight at each factor.

As mentioned in the preceding chapters, Kruger (2008) model has identified four levels of KM maturity (Initial, Aware, Manage and Optimize) based on Six phases. Therefore, in order to explain the findings of the survey results, percentage values were assigned to the four levels based on Wijetunge (2012) recommended proportion. That is, 0-25% Initial, 26-50% Aware, 51-75% Manage and 76-100% Optimum. Thus, numerical findings of each section have been interpreted using this code and discussed in accordance with the percentage achieved.

4.1. Findings of quantitative survey

4.1.1. ICT for EAL KM processes

The overall evaluation indicated that ICT Management has received the highest score of all aspects; that is 71% and within the highest range of 'Manage' maturity level. In relation to this, respondents were asked regarding the existing ICT infrastructure and EAL's capability towards managing ICT system so as to determine the extent ICT is ready to enhance KM processes. Accordingly, most of respondents indicated that there is encouraging ICT management in EAL particularly on the capability to plan, evaluate and design an ICT system. Nevertheless, it is commented that it is not to the level of significance to manage the KM processes. In this regard, the existence of effective ICT infrastructure has obtained relatively lowest assertion.

Table 12: ICT as an enabler of KM

Measurement criteria	**Y**es, definitely	Yes, but not **S**ignificantly	No, but **P**robably within the next 5 years	**N**o
EAL is capable of **evaluating** an ICT system	32.91%	46.84%	15.19%	5.06%
EAL is capable of **designing** an ICT system	31.65%	45.57%	17.72%	5.06%
EAL is capable of **planning** an ICT system	45.57%	35.44%	13.92%	5.06%
EAL has an **effective** ICT infrastructure	27.85%	46.84%	16.46%	8.86%

As seen in the below figure, though some of respondents have regarded ICT as knowledge management by itself, most of respondents identified that EAL regards ICT as an enabler of knowledge management. This indicates that the organization has accepted ICT as an enabler to knowledge management and recognized other factors to place knowledge management visibly.

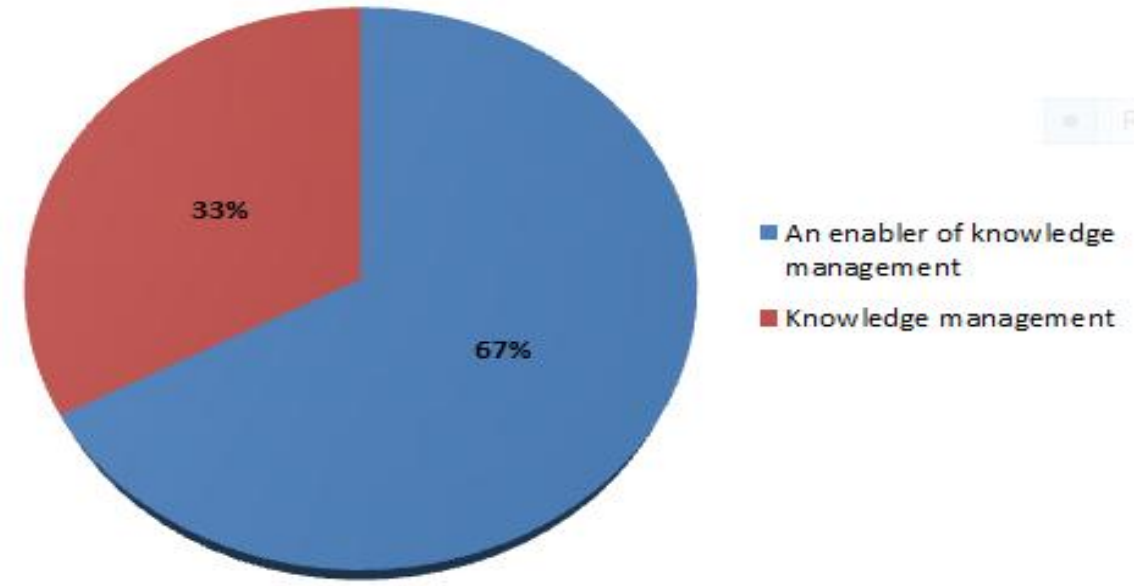

Figure 4: How EAL regards ICT

4.1.2. Information Management in the organization

The maturity of ICT and Information Management (IM) are interdependent in that the effectiveness of ICT facilitates the practicability of the latter. Thus, the overall score of Information Management in EAL has gained slightly lower result than ICT Management which is about 64%. In this regard, respondents were asked for their opinions towards Information Management activities in EAL and the corresponding tools & services. Accordingly, most of respondents' answered that EAL is proficient in information management activities though it is not to the level of significance to catalyze KM processes. Thus, on areas of Identification of information needs, Acquisition of information, Information storage, Information distribution and Information retrieval, respondents believed the existence of the required proficiency with scope for further development. However, Information disposal, Protection of information and determination of the value and cost of information are noted with somewhat lower ratings and responses tend to unfavorable valuation of the inexistence.

Table 13: Proficiency in Information Management activities

Measurement criteria	**Y**es, definitely	Yes, but not **S**ignificantly	No, but **P**robably within the next 5 years	**N**o
Identification of information needs	21.52%	60.76%	16.46%	1.27%
Acquisition of information	15.19%	59.49%	22.78%	2.53%
Information storage	25.32%	55.70%	16.46%	2.53%
Information distribution	15.19%	54.43%	27.85%	2.53%
Information retrieval	16.46%	55.70%	25.32%	2.53%
Information disposal	8.86%	44.30%	34.18%	12.66%
Protection of information	26.58%	46.84%	24.05%	2.53%
Determination of the value and cost of information	11.39%	34.18%	37.97%	16.46%

In an attempt to gauge the availability of institutionalized information management tools and services, many of the respondents' acknowledged the availability of tools and services in EAL. However, the availability of Information service/Library has received the lowest ratings.

Table 14: Institutionalized Information Management tools and services

Measurement criteria	**Y**es, definitely	Yes, but not **S**ignificantly	No, but **P**robably within the next 5 years	**N**o
Inventory of information entities	18.99%	48.10%	21.52%	11.39%
Information management system	26.58%	55.70%	12.66%	5.06%
Databases	40.51%	48.10%	10.13%	1.27%
Information service/Library	13.92%	41.77%	29.11%	15.19%

Furthermore, most of the respondents' (63%) replies indicated that EAL regards Information Management as a prerequisite (enabler) for knowledge management. Alike ICT, recognizing IM as prerequisite (enabler) for KM is a key step to materialize KM in an organization.

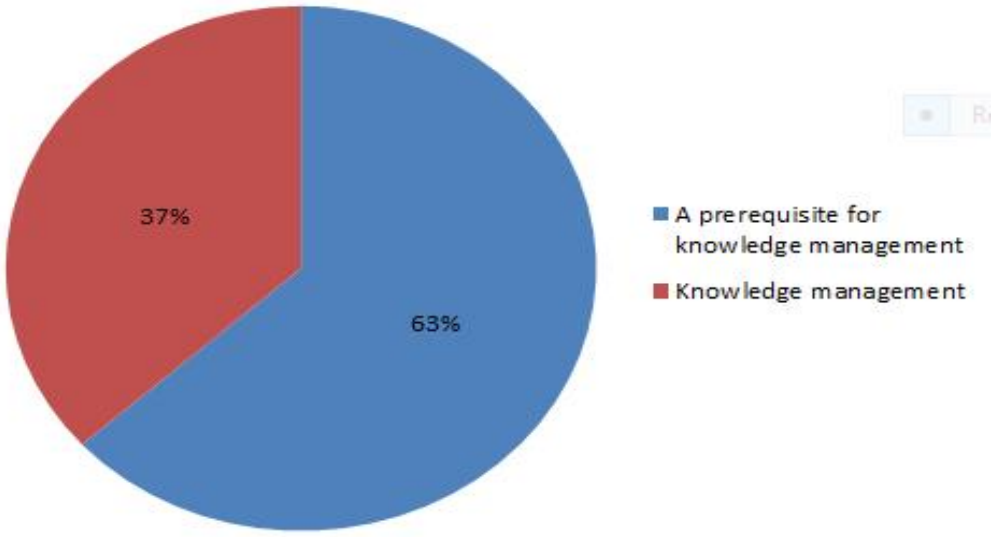

Figure 5: How EAL regards IM

4.1.3. Organizational Principles, Policy & Strategy on KM

4.1.3.1. Formulation of KM Principles, Policy & Strategy

KM issues which comprise the corresponding principles, policy and strategy were assessed to evaluate the readiness of the organization to formulate KM. Accordingly, the overall rating exhibited an entry to managed level by scoring 53%. In relation, several questions which helped to know how the organization regards knowledge and the existing structure for KM were

forwarded. As indicated in figure 6, respondents replied favorably that knowledge is seen by EAL as strategic resource even if the need for improvement is pin pointed by some participants. On the other hand, Chief Knowledge Officer (CKO) participation in the formulation of business strategy has received the lowest score which indicates that the inexistence of knowledge management as a function.

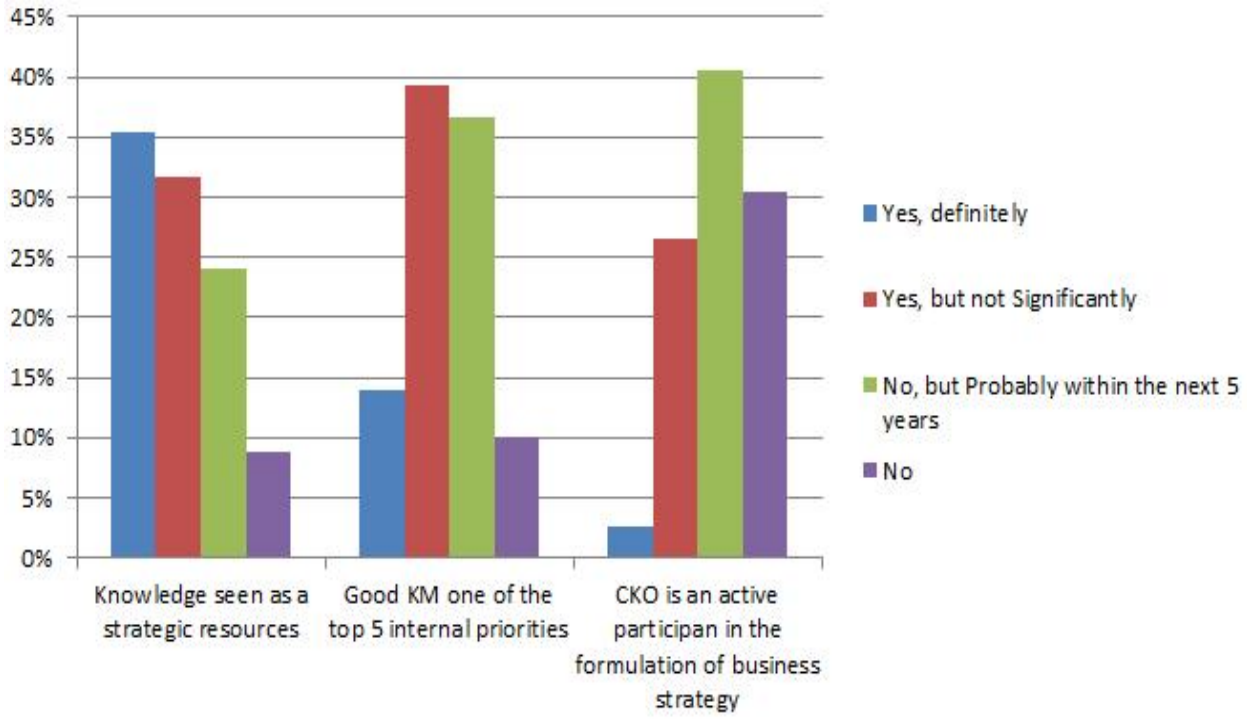

Figure 6: Knowledge as strategic resource

In general, the evaluation of KM policy, strategy and its communication to staff revealed that EAL does not have clearly defined KM policy and strategy. In this regard, the inexistence of KM strategy confirmed by significant number of respondents (about 87%) and hence not communicated widely as exhibited by 90% of respondents.

Table 15: KM Policy and Strategy

Measurement criteria	**Y**es, definitely	Yes, but not **S**ignificantly	No, but **P**robably within the next 5 years	**N**o
EAL has clearly defined KM policy	5%	22%	38%	35%
EAL has clearly defined KM strategy	3%	10%	43%	44%
The KM strategy communicated widely to staff	0%	8%	24%	68%

4.1.3.2. Motivating factors for KM in EAL

As depicted below in Table 16, respondents have identified motivating factors in establishment of effective KM in EAL. Among these, the need to share knowledge rapidly, improve working relation and make information available to staff are identified as high relevant factors.

Table 16: Motivating factors for KM

Measurement criteria	**Y**es, definitely	Yes, but not **S**ignificantly	No, but **P**robably within the next 5 years	**N**o
Improving work efficiency through producing and sharing knowledge	56%	28%	11%	5%
Decentralization of authority	34%	38%	20%	8%
Releasing information and making it widely available to staff	51%	30%	15%	4%
Promoting life-long learning	43%	25%	23%	9%
Improving transparency	44%	28%	22%	6%
Improving working relations	53%	16%	22%	9%
Making up for loss of knowledge (due to staff turnover, retirements, etc.)	48%	19%	24%	9%

4.1.3.3. Initiatives for KM in EAL

Respondents were asked to identify the initiatives that EAL has taken to ensure effective knowledge management.

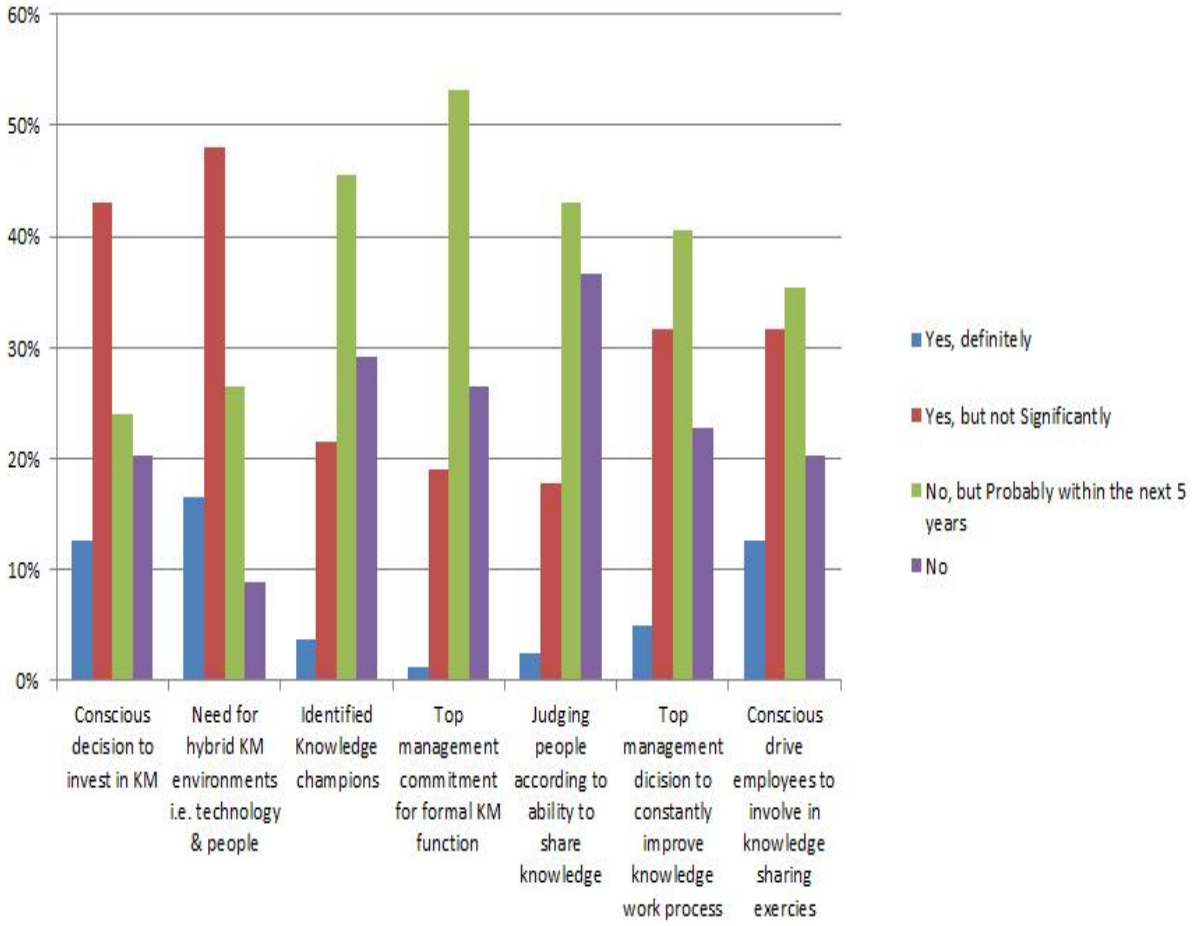

Figure 7: Knowledge management initiatives in EAL

From the above figure**,** it can be seen that the replies has demonstrated that most of the initiatives fall under the measure category of 'No, but Probably within the next 5 years'. Moreover, the evaluation has indicated that the initiatives particularly related to the establishment of KM as a function (such as identification of knowledge champion, top management commitment and improving knowledge work processes) are considered as initiatives which potentially could be materialized in the coming years. In contrast, the initiatives to invest in KM activities and creating hybrid KM environment have received higher ratings. These elements are; of course, key to step forward in the remaining KM initiatives as indicated in Kruger's (2008) model.

4.1.4. Implementation of KM

Implementation of KM is one of low rated elements in EAL with an overall assessment of 49% score. Table 17 and Table 18 demonstrated further analysis that has indicated the specific factors at which unfavorable organizational arrangements and staff activities are being exhibited.

In order to assess EAL's strategic arrangements that have been made to enhance knowledge management function, respondents were asked for their view with respect to several organizational initiatives. Accordingly, the existences of favorable KM initiatives of institutionalizing training/mentoring programs and communication with customers have been witnessed by significant number of respondents. On the other hand, initiatives such as creation of central coordinating unit, appointment of CKO and establishment of informal networks (communities of practice) are among the lowest rated initiatives. To this end, 95% of respondents confirmed that CKO position does not exist and some have forwarded their positive assumption that EAL will appoint CKO in the coming 5 years. Besides, incentives for knowledge sharing and communication with suppliers were also poorly rated.

Table 17: Organizational strategic arrangements for KM implementation

Measurement criteria	**Y**es, definitely	Yes, but not **S**ignificantly	No, but **P**robably within the next 5 years	**N**o
Opening up bureaucratic divisions	11%	34%	25%	29%
Creation of a central coordinating unit for KM	4%	16%	48%	32%
Appointment of CKO with executive status	0%	5%	38%	57%
Reorganization of offices (eg. open plan offices)	8%	23%	44%	25%
Establishment of informal networks (eg. communities of practice)	3%	13%	51%	34%
Institutionalization of training and mentoring programs	23%	44%	22%	11%
Communication with customers	20%	46%	27%	8%
Establishment of incentive schemes for knowledge sharing	8%	15%	39%	38%
Communication with suppliers	23%	32%	38%	8%

Beyond the organizational arrangements, respondents have also evaluated individual staff engagements in KM activities. In this regard, most of respondents indicated that e-mail is the main media being used to communicate and share information. Besides, considerable number of respondents acknowledged the existence of informational meetings and presentation of projects in the organization. Nevertheless, valuable activities such as peer reviewing and/or quality reviews are distinguished as neglected.

Table 18: Individual/staff KM activities

Measurement criteria	**Y**es, definitely	Yes, but not **S**ignificantly	No, but **P**robably within the next 5 years	**N**o
Informational meetings	22%	41%	20%	18%
Peer reviewing/quality reviews	5%	41%	37%	18%
Presentations of projects and activities	13%	47%	29%	11%
Information sharing by electronic device (e-mail, etc.)	52%	38%	5%	5%
Building databases	15%	38%	29%	18%

4.1.4.1. KM responsibility in EAL

It is possible to know that most of respondents have considered HR department and its staff as the primary responsible entity for KM in EAL while some respondents have considered IT department as responsible entity.

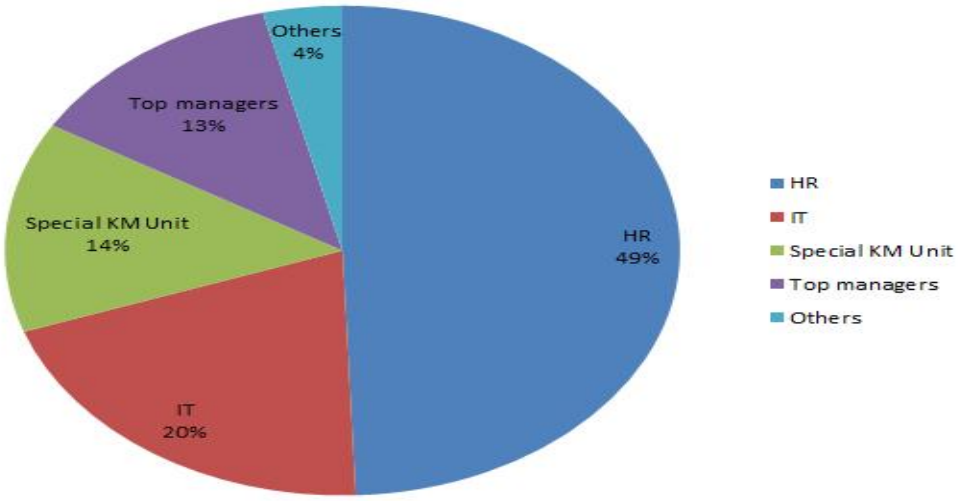

Figure 8: KM responsible entity in EAL

4.1.4.2. Challenges for KM in EAL

Several questions that enable to identify challenges of KM implementation in EAL were forwarded to respondents. To this end, difficulty in capturing employee's undocumented knowledge took the lion share among the challenges. Furthermore, strong focus on ICT than on people or organizational matter, lack of time or resources to share knowledge and not making documents available to others are also identified as challenges. Moreover, reactions of more than 70% respondents revealed that EAL's process lacks indicators or metrics to measure the implementation of knowledge management practices.

4.1.5. Ubiquitous knowledge transfer

Upon evaluating the overall maturity of EAL towards the KM practice of external knowledge exchange and application, it has received the lowest rating of all which is 41% (awareness level). To this end, respondents were asked to identify outside knowledge source from perspectives of both the organization and staff. Accordingly, respondents' feedback indicated that EAL has limited interaction with Universities/Research centers, Local governments, Peer organizations and Trade unions. On the other hand, relatively high reliance is noted on outside knowledge coming from departments within the organization, Consulting firms, Customers and Suppliers.

Table 19: EAL's outside knowledge source

Measurement criteria /knowledge source/	**Y**es, definitely	Yes, but not **S**ignificantly	No, but **P**robably within the next 5 years	**N**o
Between departments in EAL	42%	33%	10%	15%
Local governments	10%	30%	30%	29%
Peer organizations	15%	51%	22%	13%
Universities/Research centers	1%	25%	33%	41%
Suppliers	27%	42%	20%	11%
Customers	28%	48%	14%	10%
Consulting firms	38%	51%	5%	6%
Trade Unions	3%	38%	30%	29%
Others	10%	22%	25%	43%

The individual level perception were also analyzed by requesting respondents for their reflection whether staff is encouraged to take up position in any of the above listed potential knowledge sources. In this regard, except relatively greater rating (that is only 13% of responses) obtained in conformity to the opportunity to take up position in other departments in EAL, the rest have received lower ratings.

4.1.6. KM maturity at EAL

4.1.6.1. Overall KM maturity level

The KM maturity scores received from the overall ratings of EAL staffs are given in Table 20. To this end, ICT Management and Information Management have achieved the highest average score of about 68 percent. On the other hand, implementations of KM and Ubiquitous knowledge have obtained the lowest ratings.

Table 20: Overall KM Maturity Level of EAL

Section/Aspect	Score Achieved	Maximum Score Expected	Overall Score (%)
1. ICT Management	4,512	6,320	71.39
2. Information Management	69,658	108,072	64.46
3. KM Principles, Policy and Strategy	73,869	139,040	53.13
4. Implementation of KM	51,300	103,964	49.34
5. Ubiquitous Knowledge	46,674	114,076	40.91
6. KM Growth	191	316	60.44
Total/Overall	**246,204**	**471,788**	**52.18**

Based on the ratings mapped on figure 9 and four levels of knowledge maturity of Kruger (2008), none of the elements out of six is reached optimum. Instead, four of the elements (ICT Management, Information Management, KM issues and KM growth) noted to be at managed level while implementation of KM and Ubiquitous knowledge are yet at awareness level.

The overall rating which is about 52 percent indicated that the KM maturity of EAL is within the range of managed level with partial fulfillment of Phase 3 characteristics. That is, according to Kruger and Snyman's (2007) definition of KM maturity phases, Phase 3 comprises the characteristics:

- ICT capable of supporting managerial decision and knowledge work
- Organization-wide knowledge management policy in place
- Knowledge shared throughout the organization
- Establish working knowledge management function
- Encourage formal training programs, brainstorming session, self-enrichment and learning

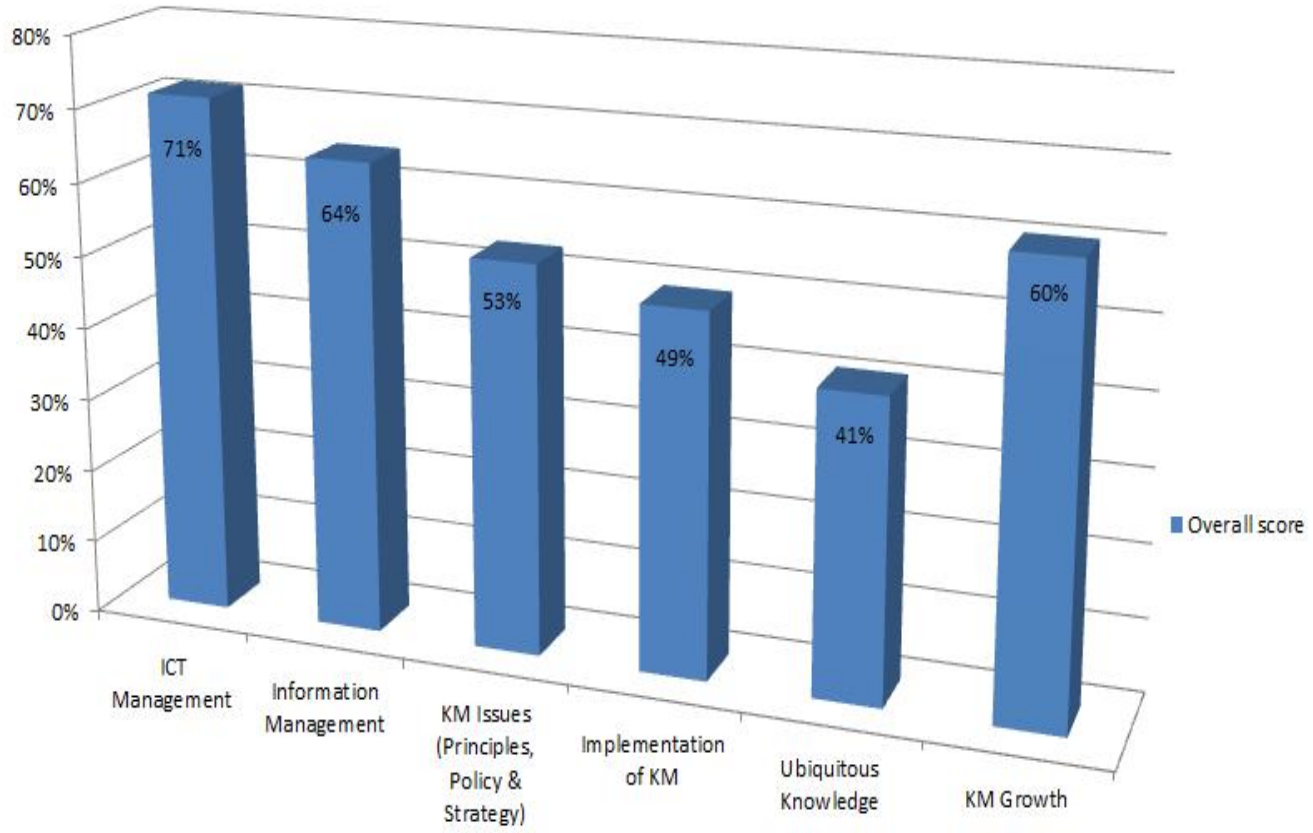

Figure 9: Overall KM Maturity of EAL per Maturity Sections

4.1.6.2. Assessment of KM growth

With regard to growth in KM maturity, about 60% overall score was obtained by EAL which has been categorized in the level of 'managed'. In relation to this, as depicted in figure 10, most of respondents are of the opinion that although growth occurred in the organization, it was not significant (1-2 maturity levels) while some argued no growth has taken place so far, some others anticipated that it could be seen within the coming 5 years.

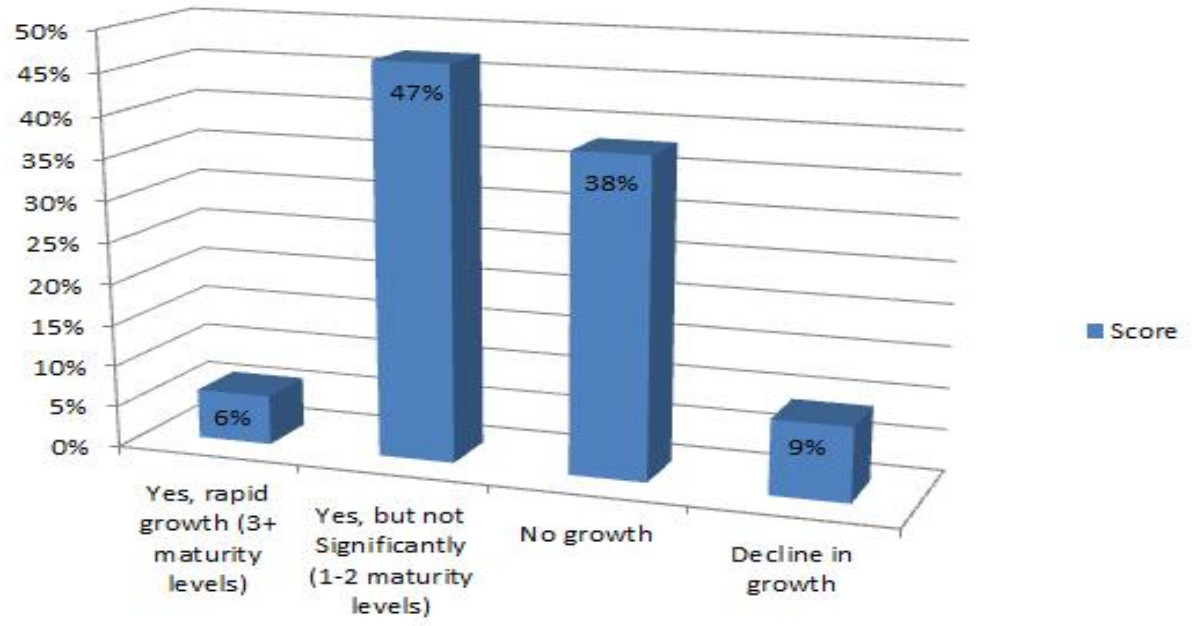

Figure 10: Growth in KM Maturity - EAL

Hence, the overall assessment of the organization (that is EAL has moved from Phase 2 and entered to Phase 3) noted to be consistent with most of respondents' feedback. Moreover, the positive perception over KM progress in the coming 5 years indicates that EAL is on growth track and struggling to advance in the level of maturity.

4.1.6.3. KM maturity level by position

In order to evaluate the survey result by position and determine the consistency of respondents' views regarding KM practices in EAL, the analysis has been performed by grouping the input data of management and non-

management responses separately. Accordingly, the scores assigned by position of management and non-management are depicted hereunder.

Table 21: KM Maturity Level of EAL by Position

Section/Aspect	Management Score (%)	Non-Management Score (%)
1. ICT Management	65	73
2. Information Management	54	67
3. KM Principles, Policy and Strategy	55	53
4. Implementation of KM	45	50
5. Ubiquitous Knowledge	34	43
6. KM Growth	56	62
Total/Overall	**52**	**58**

An overall score variance of only 6 percent is demonstrated between management (52%) and non-management (58%) responses. Moreover, maturity levels are aligned at each aspect of measurement whereby both management and non-management level respondents have rated ICT management, information management, KM issues (KM Principles, Policy and Strategy) and KM growth rated as 'managed' level; while implementation of KM and Ubiquitous knowledge received score for 'awareness' level only.

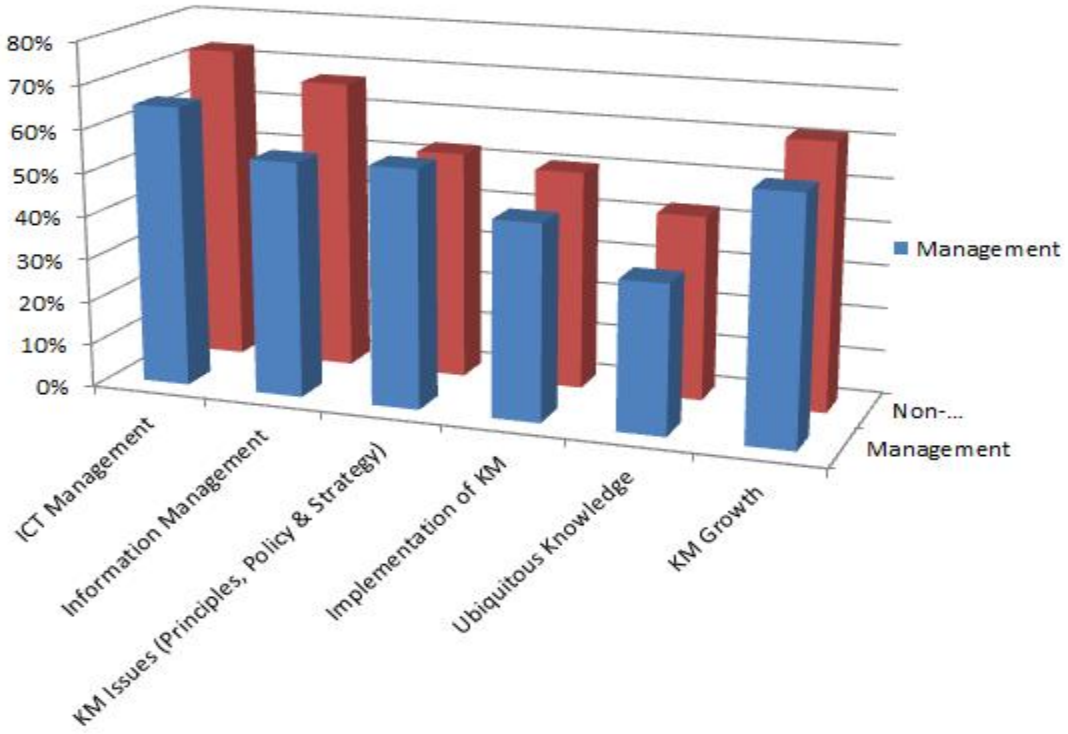

Figure 11: KM Maturity Level of EAL by position

As indicated in the above figure, relatively significance variances are noted at aspects of ICT Management and Information Management. To this end, it is noted non-management employees tend to the extreme positive ratings (Yes, definitely) while management groups' responses exhibited moderate ratings (mainly between 'Yes, but not significantly' and 'Probably within the next 5 years').

4.2. Qualitative analysis

Interview has been conducted with 5 executive management members in order to obtain high level perception and detailed feedback on KM initiatives or practices. Accordingly, their views are summarized in line with outlined interview questions (Appendix 4) and presented hereunder.

Regarding support of ICT in KM activities, all of the interviewees agreed on EAL's willingness to invest on ICT and bringing in new technologies. Thus, staffs (both technical and

functional) are exposed to the new IT developments as most of EAL's core processes are being supported with IT. However, the interviewees explained that this does not mean the organization has fully exploited the available technologies to their fullest capacity particularly in KM activities. In this regard, one of the interviewee commented that "there is notable disintegration among the process, human and technologies; otherwise the available technology is ready to support knowledge management". In this regard, the interviewees overall outlook noted to be in support of the quantitatively analyzed figure by which the organization presumed to have encouraging ICT management. Besides, the corresponding improvement areas to make ICT in support of effective KM are consistent with the feedback collected through questionnaire.

Furthermore, alike the responses from questionnaire's participants, the interviewees confirmed that company e-mail is being widely used in the organization. In addition, portal, internet, blog/discussions forums and other standardized applications which have embedded KM (such as SAP, Sabre and Maintenix) were mentioned as tools and services that could have been in support of KM if same had been used optimally. It is also stated by most of the interviewees that the IT in EAL seems running independently as it is not effectively supporting the prevailing process and the corresponding relevant documentations to manage knowledge centrally. Trip report, exit interviews, incident report, project lessons and coaching programs were among the lists which were mentioned as critical knowledge sources but not currently supported with IT and not managed centrally. Absence of proper change management is mentioned as one of the major reasons for lacking alignment between the technology and people. As a result, people do not get concerned about KM activities while performing their day to day activities using several IT applications. To this end, one of the interviewee said that "…EAL does not invest on change management and trainings to the level of satisfaction while implementing sophisticated and world class technologies".

Interviewees were also requested for their opinion whether EAL regards knowledge as strategic resource. To this end, all of the interviewees commonly provided their consent that EAL regards knowledge as strategic resource and top management commitment to streamline knowledge. In this regard, one of the interviewee said that "One of the secrets of EAL's success is its due consideration to knowledge; and even if there is no clearly defined KM strategy, its importance is well recognized and expressed within HR strategy". The other interviewee

mentioned the operating standard "Achieving Competitive Excellence (ACE)" as one justification and said "…ACE is about knowledge which deals with each processes' definition, documentation and cross functional relations. Through ACE tools, continuous improvement can be guaranteed and knowledge can be transferred seamlessly". Moreover, the organization's well documented and updated policies and standard operating procedures/manuals are also accepted by all of the interviewees as indications to justify how the organization valued knowledge. The interviewees' comment that confirmed EAL regards knowledge as strategic resource has validated the quantitative result in 'Formulation of KM' section. However, the perception of the interviewees' on top management commitment contradicts with the questionnaire participants' opinion. This is so for the reason that all of the interviewees are senior managers who believed committed for KM activities without measurement metrics to assure same.

Further, it is mentioned that almost all of the activities in EAL are being done based on stipulated policies and accompanying working procedures. Thus, each policies and procedures/manuals have ownership to be well maintained, disseminated and implemented timely. Yet, one of the interviewees argued that the transformation of the environment has created a gap in maintaining policies and procedures electronically; and difficult to ensure dissemination and implementation. In this regard the interviewee suggested that "EAL has to work on electronic documentation, workflow integration and standardization". On another view, introduction of coaching and mentoring program into EAL's working system have also been mentioned by one of the interviewees as indication of taking knowledge as strategic resource. Nevertheless, in similar attitude with most of the questionnaire respondents, interviewees agreed on the need to focus on KM principle, policy & strategy with special attention to distinctively define and implement the corresponding policy and strategy. It is clearly discussed above in the overall assessment of KM at EAL that these factors are key milestones to raise the bar to the next phase of KM maturity level.

In terms of structurally defined KM as a function, the interviewee assured with one voice and in agreement with the responses of the questionnaire that there is no visibly assigned position to coordinate KM practices in EAL. One of the interviewee said that "knowledge base exists in the minds of the individuals as the structure is not designed to coordinate and maintain corporate knowledge. Besides, the structure needs refinement to clearly define the process and

the corresponding enabling resources (IT and people)". On the contrary, another interviewee argued that though KM is not defined as a function in EAL, since the organization is working in a well regulated industry, the haphazard knowledge management activities are noted particularly at core operational areas. Moreover, recent introduction of the concept of "Center Of Excellence (CoE)" has been mentioned as an instance of initiative to derive structured KM. In this regard one of the interviewee said that "….even if CoE is primarily considers transformation of all processes to IT enabled, in the meantime it will trigger KM through IT". Another interviewee has supported this opinion by saying "CoE office is established as part of KM to confirm organization of scattered knowledge and processes. The office do also has basic objective of ensuring alignment of Technology, Process and People". These diversified views are fully in support of the quantitatively analyzed data of inexistent KM function and indicates the initiatives that EAL has been taking to get into the pathway of establishing KM as a function.

Furthermore, all agreed that the organization growth and expansion along with the availability of few experienced staff, demands well-structured KM and knowledge base system. In relation to this, most of the interviewees' feedback indicated that HR is regarded as the responsible entity for KM initiatives while some has reflected their opinion in the criticality of IT as enabler. Accordingly, the coaching and mentoring programs which are established by HR were expressed as proof of responsibility. Here worth to mention that the interviewees' perception is noted to be consistent with responses of most of the questionnaire's participants. Moreover as discussed in the preceding sections, most of the KM initiatives in the organization have been discussed within the HR strategy and corresponding policy & procedure. Besides, IT noted as in design to support the KM activities structurally. These portray that currently HRM is in a position to coordinate with IT and other stakeholders to enhance KM practices in EAL and instill the KM processes into the organization's system.

Interviewees have also enquired to identify the challenges and factors to knowledge management initiatives. In this regard, knowledge sharing practice, documentation, culture and organizational focus has been discussed. Regarding knowledge sharing, all of the interviewees confessed that it is not to the level of satisfaction. To this end, the society and organization culture as whole pinpointed as weak point. Some claimed the society's thinking has not yet been transformed from taking knowledge as power and hoard. The organization as well focus on day

to day operation and KM (for instance documentation and sharing) is not embedded in day to day activities. To this effect, some of the interviewees mentioned an instance of recent external audit feedback (Audit on SAP-ERP) which stated most of the findings are related to lack of proper knowledge management. Nevertheless, the mechanisms and tools such as portal share point, e-mail and regular crew meetings were mentioned as good practices of EAL for knowledge sharing. In relation, one of the interviewee expressed that "in our division, regular meetings' minutes are well recorded and shared/posted on portal page for ease of reference. Besides, ACE activities and standard operating procedures are also shared on portal as part of knowledge sharing". This practice is summoned by another interviewee mentioning "…although the organization didn't establish corporate wide enriched knowledge resource, our department has a practice of retaining incidents' history and share the document on portal for internal staff access". The coaching program along with corresponding assessment is noted by the interviewees as good organizational culture for knowledge sharing. Finally, alike the factors identified through the questionnaire, people willingness/readiness, leadership (being role model) and reward system mentioned as crucial for the organization. Here, one of the interviewee forwarded suggestion of "HR should coordinate all relevant KM initiatives for the organization competitive advantage rather than focusing on traditional activities".

Regarding the external knowledge exchange and applicability, the interviewees explained the fact that the organization is working in internationally standardized industry. Accordingly, the availability of high interaction with regulatory bodies, competitors, partners and stakeholders were mentioned as link point for boundary-less knowledge exchange. Trainings, meetings, conferences, events …etc. were identified by the interviewees as the occasions whereby external knowledge transfer to happen. Training materials, minutes and trip reports were also among the documents by which external knowledge could be captured and integrated into the system, as appropriate. However, these all are alleged for lacking central management and consistency of documentation. To this end, one of the interviewee stressed that "….in early days trip report was well recorded and documented in organized manner as external knowledge source. But, currently the culture seems neglected which should be reinstated and effort to support the documentation with IT for central management and consumption". The unavailability of measure for external trainings' impact on day to day activities or lack of metrics is identified as an issue.

On the other hand, Senior Management's weekly meeting has been identified as good opportunity to exchange knowledge. During this meeting, each one in the meeting required to brief his/her area of operation along with the external exposures he/she might passed through. One of the interviewee expressed the positive impact of this meeting saying "The knowledge exchange at the senior management meeting could be in unorganized manner since it is somewhat briefing on the experiences and/or exposures. However, the best practices will be well discussed and if accepted for implementation, the assignment will be forwarded to the concerned with proper subsequent follow up. Other participants in the meetings are also advantageous from the shared and discussed best practices which ultimately will have invisible impact on day to day activities". In addition, it is mentioned by one of the interviewee that "the industry is rich in knowledge resource and benchmarks are readily available as long as EAL is ready to adopt". Yet, all the interviewees agreed on the importance of centrally coordinated documentation and archiving system to be benefited from the outside exposures and experiences. This limitation is identified with the questionnaire feedback as well and hence found to be proven gap for EAL with respect to boundary-less knowledge transfer.

Lastly, KM importance is distinguished by all the interviewees as unquestionable to EAL and the need to structure the practices for the organization's competitive advantage is underlined. To this end one of the interviewee said that "it is high time for EAL to think about well-structured knowledge management in order to address challenges of dynamism due to turnover, technology, the environment…etc.". Furthermore, upon evaluating KM growth in EAL, they all commonly agreed on the existence of some noticeable initiatives which evidenced the organization awareness and attempt to formulate knowledge management. Accordingly, four of the interviewees agreed with the quantitative result with assumption EAL is in the middle growth stage of KM – i.e. cannot be called fully unknowledgeable about the practice or highly developed in the area. In contrast, one of the interviewees argued that the organization is in a more progressive end beyond the midpoint; but which noted to be contradicts with the majority's view. Hence, the assessment feedbacks mainly indicate KM maturity in EAL is away behind the growth climax and thus has to effort on identified improvement areas.

4.3. Discussion

4.3.1. ICT and IM for KM

The organization's capacity towards KM depends on the available tools, the usage of ICT and the organizational structure (Mathi, 2004). Besides, Pee & Kankanhalli (2009) KM model suggested technology aspect of KM to be assessed with the available infrastructure (such as intranet portal) and ICT with continual improvement and investment. To this end, EAL exhibited high utilization of intranet portal along with outlook service for knowledge transfer and communications. Moreover, the organization is known for investing on ICT as the industry standard and competition demands same. Besides, Kruger and Johnson (2009) research determined that large organizations, such as EAL, are known for their outperformance in ICT infrastructure and Management. However, in order to take up EAL's ICT management to the optimum level, the organization should ensure the capability of shifting data and information to knowledge by means of ICT and in support of business operations (Kruger, 2008).

On the other hand, studies indicated that technology enables knowledge management within an enterprise. In agreement with Maier (2007), DiGiacomo's (2003) study pointed out that lack of proper tools and technology infrastructure can lead to failure in KM. As a result, properly assessing and defining information technology capabilities in an organization are key for effective knowledge management. Kruger (2008) supported this thought with opinion stating that 'today there is a growing realization that organizations can attain maturity in knowledge management only through a healthy coexistence of technology, process and people'. As a result, taking the favorable feedback of realizing ICT as KM enabler, EAL has to assess the process and people factors as well.

In related subject, The Economist (2005) survey disclosed the facts that effective information management depends on capturing good quality of information from outside the enterprise as well as within. Moreover, Kruger and Snyman (2007) assessment instrument indicated the existence of information management policy and strategy is key step to establish effective IM. To this end, EAL has got defined IM policy and procedure

under the corporate manual (Ethiopian MPM, 2013). Besides, the strategic direction of EAL's IM is articulated under the organization's ICT Strategy (2011). As a result, in line with respondents' feedback, the organization's IM has been showing promising conditions to formulate effective knowledge management process. Nonetheless, as many respondents put reservation on full conformity to the level of significance, the manifested gaps and room for improvement needs attention to bring the growth to the level of expected proficiency.

As indicated in figure 5, though significant number of respondents taking IM as prerequisite to KM, the respondents who are regarding IM as KM cannot be neglected. To this end, Chen, Snyman and Sewdass (2005) expressed how the terms IM and KM are confusing terms to the extent that some organizations have been under the impression that they were implementing KM whereas they were actually implementing IM. These authors, yet, have shown the interrelationship between IM and KM to influence each other and contribute to the business efficiency and effectiveness. In similar statement Kruger's (2008) has placed caution not to mix up IM with KM and provided the definition of IM as it is about managing resources (such as information media, people and physical facilities) to enable them play role towards corporate strategy.

4.3.2. Principles, Policy & Strategy on KM

EAL's HCM Strategy (2010) has tried to incorporate knowledge management under the umbrella of talent management strategy. Yet, EAL's manual of organization (2013) exhibited that the inexistence of visually labeled structure to position CKO. These conditions indicated that KM importance is somewhat recognized in EAL while the strategic road map is not clearly defined to enhance corporate wide effective KM.

In this regard, literatures magnificently argued for the criticality of KM strategy in today's dynamic world, particularly business firms under fierce competition. For instance, Zack (1999) has clearly put the importance of strategic knowledge management for the competitive advantage of an organization. It is also stressed that an organization success can be accomplished by grounding knowledge management within the context of business strategy. In similar statements other researchers like Greiner, Bohmann &

Krcmar (2007), Foon & Eurn (2011) and Kruger (2008) have elaborated the essence of KM strategy to govern improvements by taking several industries into consideration. To this effect, being EAL is not an exception, the competition there in demands focused and clearly defined KM strategy; rather than taking small part under the HCM strategy. In addition, policy is also crucial for organization to able to guide strategically set vision. According to Kruger (2008), KM policy enables an organization to inculcate KM as a culture. Thus, the gap of unavailability of clearly defined KM policy in EAL is another concern area to the formulation of KM towards the optimum level.

On the other hand, ET's value statement defined ET as high performance and learning organization. Furthermore, it is specified in EAL Vision 2025 and Strategic Road Map (2009) that the organization recognizes the importance of transfer of knowledge and hence encourages free flow or sharing of knowledge. Besides, EAL's Human Capital Management Strategy (2010) reinforced the statement by emphasizing its objective to promote employees' involvement, open communication, teamwork and cooperation. However, the respondents' feedback has indicated that the ground work to create conducive environment for knowledge sharing and making information available are still attention seeking areas. According to Pee and Kankanhalli (2009), with institutionalized knowledge-sharing culture, organizational members will be willing to contribute valuable knowledge that is important to the performance of the organization. Similarly, other studies including Davenport (2000), Smits & Moore (2003) and Kruger (2008) expressed the importance of knowledge sharing to KM as organizational culture. These all support the finding that the identification of knowledge sharing, working relation and availability of information as critical factors in a journey of KM formulation.

4.3.3. Implementation of KM

Training and Development strategy has been clearly defined in EAL's HCM strategy (2010) along with the coaching & mentoring programs' direction. Further, the corresponding policy and procedures are also stipulated in the HR Procedure Manual (2013). But, EAL structure doesn't position KM as a function and hence there is no appointed CKO. According to Kruger and Snyman (2007), the organization to be benefited from the KM strategy in supplying input to the business strategy, KM has to be

realized as a function with active participation of CKO in the organizational processes. Besides, the people dimension of Pee & Kankanhalli (2009) KM maturity model has emphasized criticality of the CKO's role in the establishment of productive KM in an organization as well as the need to place incentives to encourage knowledge sharing among employees.

KM related initiatives have been defined within the corporate HCM strategy of EAL. Besides, the tasks to reinforce the implementation of several KM initiatives and subsequent monitoring are also assigned to HR departments as indicated on EAL's Corporate HRM Procedure Manual (2013). For instances, internal communications, information exchange/crew meetings, coaching & mentoring programs, training & development, succession plan,...etc are all defined under HRM manual and the division is responsible to make the implementation possible. On the other hand, information is being managed by IT department and tools that support management decision are being availed through IT. Moreover, EAL's SOP (2014) for Center of Excellence (CoE) has exhibited that CoE is structured under IT Division which is believed to have high contribution to KM.

The organization HCM strategy (2010) has also declared that institutional knowledge stored in databases, working manuals and policy documents are the knowledge that the airline actually owns. Yet, documenting best practices has received minimal score as there is no structured way of managing external knowledge. Moreover, in spite of the fact that most of respondents determined that EAL's staff consider sharing of knowledge is good for their career, the organizational culture to organize knowledge events and make documents available to others are unfavorably rated. Hence, factors that can improve organizational arrangements and individual KM activities need to be addressed for issues mentioned here as well.

Furthermore, literatures (including Takeuchi, 2006 and Smits & Moore, 2003) have identified the main challenges in implementation of KM practice as difficulty in capturing undocumented knowledge, which is in line with respondents' feedback . The major reason is that tacit knowledge is deeply rooted in an individual's action and

experience; and hence articulation of knowledge in one's mind is difficult. To this effect, an organization has to take into account adopting an appropriate KM model that enable to capture and codify tacit knowledge (Dalkir, 2005). Moreover, Dalkir further pin pointed the notion of knowledge is power, lack of incentive for knowledge sharing, understanding of receiver and the organizational culture & climate to encourage knowledge sharing as chief obstacles for effective KM. In addition, research works of Hermella (2013), Habtamu (2011) and Hareya (2011) have also shown the existence of these obstacles in Ethiopian context at various organizations.

In general, even if the obstacles are noted to be multidimensional, the organizational commitment to instill suitable culture and climate can positively affect all facets of KM practices. According to Wijetunge's (2012), Pee & Kankanhalli's (2009) and Dalkir's (2005) argument, an organizational culture that encourage knowledge sharing, rewards collective work and receptiveness, nurtures effective KM towards business objective. Besides, several KM maturity models including Pee & Kankanhalli's (2009) and Kruger & Snyman's (2005) were basically launched with the objective to change the orientation of focusing on the technological aspects only. To this effect, these models give balanced consideration to people, process and technology to create optimal KM in an organization. Having all these and respondents' feedback into consideration, EAL's environment demands attention for improvement.

4.3.4. Ubiquitous knowledge transfer

Davenport (2000) has expressed the essence of knowledge exchange in analogy with genetic-scientists who have created a new flavorful tomato with commercial triumph anticipation. But, as the scientists didn't know enough about farming such as a climate for a variety, the application in different areas ended up with failure. This analogy tries to show that an organization cannot be all-inclusive by itself and hence has to positively interact with the external environment.

Moreover, Kruger and Snyman (2007) and Zack (1999) have well discussed the concept that what a firm does know and knows how to do limits the ways it can actually compete. In this regard, they have indicated the importance of strategic position to

acquire the required set of intellectual resource and operate in a competitive environment of a specific industry. As a result, formalized trans-organizational forums and subsequent documentation of best practices and lessons learnt are acknowledged as crucial. However, EAL's HCM Strategy (2010), apart from mentioning boundary-less interactions as one objective, it doesn't link the objective with structured system that ascertains the organization to benefit from external knowledge/best practices exchange. In this regard, the organization HCM Strategy as well mentioned the only initiative of seconding technical employees to partner airline in an effort of skill transfer and knowledge exchange.

4.3.5. KM maturity at EAL

Based on the analysis result and in alignment with figure 3 of the Literature Review Chapter, EAL has moved from Phase 2 and entered to Phase 3 since the evaluation revealed that the organization has possessed and/or actively working on the three characteristics of Phase 3; namely, ICT capable of supporting managerial decision and knowledge work, Knowledge shared throughout the organization and Encourage formal training programs & learning. Nevertheless, this does not mean that the organization is ready to move forward to enter into Phase 4 because it lacks the 2 characteristics of Phase 3. These are, placing organization-wide knowledge management policy and establishment of working knowledge management function. As clearly stated in Kruger's (2008) model, these characteristics are key elements of Phase 3 to ensure formulation of knowledge management in an organization. Moreover, the results also indicated that improvements are sought on knowledge sharing and encouragement of brainstorming sessions to progress forward.

According to the literature related to Knowledge Management in Malaysian Airline Industry, this trend is noted to be common in airline industry. In this regard, study of Foon and Eurn (2010) has stipulated the recommendations that the airline industry to get committed on improving organizational learning and the need to assign dedicated CKO.

In addition, as illustrated in figure 11, there is a strong indication that management staff is in a better position to critically assesses the existing ICT infrastructure and the capability of managing information towards knowledge. Moreover, management staffs are well conversant with the prevailing information management strategy and policy to evaluate its effectiveness in relation to KM. Thus, management staff has rated the ICT infrastructure and Information Management activities with scope for further development to reach to optimum level. In addition, while both management and non-management groups have provided low rating for Ubiquitous knowledge aspect, the perception difference of about 8 percent is noted regarding effective external knowledge exchange. Again, considering the reality that management holds the key to open-up the environment for outside knowledge, the lowest evaluation of management group on Ubiquitous knowledge indicates weaknesses on outside knowledge application. Otherwise, the overall measurement falls within the range of same level of maturity.

Literature on KM maturity, including Kruger & Johnson (2009) and Wijetunge (2012) have shown that it is not uncommon to encounter some differences of perceptions between management and non-management. To this end, these studies have pointed out the possible causes by stating these could happen for the reasons that the difference of insights regarding 1) the success of implementation of KM; 2) the efficiency and effectiveness of KM issues, policies and strategies; and 3) sufficient support given to the institutionalization of KM endeavors. Moreover, Kruger & Johnson's study identified that in a practical sense, growth in KM might be more dependent on a deliberate, conscious and calculated managerial effort. Thus, EAL's managerial responses are noted to be affected with the prevailing perception and access to strategic issues as well as the outlook towards KM resources. Nevertheless, the overall measure difference (between managerial and non-managerial level) in EAL context is not as such exaggerated to trigger further root cause analysis.

CHAPTER V

CONCLUSION AND RECOMMENDATION

5.1. Conclusion

This study has pronounced the importance of knowledge management, nowadays, for business organizations especially in the creation of sustainable competitive advantage. Yet, building effective KM in an organization is not one time exercise rather progresses gradually through stages of growth. Accordingly, KM maturity is structured as a staged development which is not achievable in one giant leap. In this regard, various factors have been researched to identify the characteristics of each stage of KM growth. To this end, while a number of elements are incorporated into different measures, ICT's growth is commonly renowned for its contribution towards establishing the KM practices at each levels of maturity.

As initially framed, the study aimed to measure the KM maturity level of EAL taking the ICT, KM principles, policy & strategy and knowledge exchange into consideration so as to make the organization cautious about the gap and required actions. Accordingly, Kruger's (2008) KM maturity model along with its data collection instrument has been adopted to determine the KM maturity in EAL. In this research mixed approach (quantitative and qualitative) is followed; thus the constraint of limited sample size of quantitatively analyzed data has been well validated with qualitatively analyzed focused interview results. To this effect, the analysis result has signaled that the model is effective to evaluate the organization's KM maturity. In effect, the following basic conclusions are drawn:

i) ICT growth

EAL is known for willingness to invest in high technologies and hence its ICT platform is ready to support KM. However, its disintegration with the prevailing process and people marginalize ICT's contribution. Yet, due to increased reliance on technology for core activities of the industry, ICT in EAL evolved to manage level which ascertains that the progress is beyond operational support. Intranet (company portal), e-mail (outlook service), website and some KM embedded applications like SAP have high contributions to raise the bar. To this effect, the blended characteristics of ICT that supports management decision and business

transformation & competition is exhibited. But the growth is limited to support KM to the higher level as it is not optimally mature in every aspect and for factors other than ICT.

ii) KM principles, policy & strategy

The study disclosed the positive initiatives of EAL such as seeing knowledge as strategic resource and the existence of encouraging ICT environment. But, the challenges of low management commitment to KM, not defining KM as a function and the overall organizational and individual culture adversely affected the organizational KM issues. To this effect, it is concluded that EAL does not have clearly defined KM policy and strategy which hinder the development of KM to ascertain the implementation and beyond.

iii) Knowledge exchange

The 'Ubiquitous Knowledge' maturity is poorly rated in EAL from which it can be concluded that the environment is not suitable to utilize outside knowledge. On the other hand, the industry's reliance on seamless knowledge exchange, demands quick fix on different dimensions of KM practices. In spite of the fact that 'Ubiquitous Knowledge' is a phase by its own in Kruger's model, it is also highly related with findings in other phases of the maturity. For instance, the initiatives such as establishment of informal networks, encouragement for knowledge sharing and robust working relations remain among the factors which directly impact knowledge exchange. Moreover, it is confirmed that the organization relied upon knowledge coming from departments, consulting firms, customers and suppliers which requires knowledge exchange activities between organizations as well as the staff in it. But EAL's contextual interactions disclosed that it is not mature to the industry's expectation.

It is also important to note that two interesting evaluation results were obtained by which it can be concluded that the perceptions of diversified participants favorably supported each other. The first one dealt with the analysis result of managerial and non-managerial level KM maturity ratings. In this regard, perception differences on some factors have been noted for possible reasons of insight and access differences. However, being the variance is insignificant; it didn't make any difference on the level of KM maturity which has been determined with the overall assessment. The second interesting relation is that quantitatively analyzed output has been rationally validated with firm assertion of qualitative feedback. That means, the input

gathered through the structured questionnaire was found to be consistent with the interview discussion, directly or indirectly. In view of all these, it is concluded that the evaluation is logical and acceptable to take the result as benchmark.

In general, the overall evaluation result determined that EAL is in Phase 3 of the maturity cycle according to Kruger's (2008) scale. As explained under literature review part, the organizations should progress from one maturity level to the next without skipping any level. However, in practice organizations may employ some key characteristics of higher maturity level than they are in. With respect to this, EAL has manifested some KM maturity characteristics of the higher levels (levels 4 and above). But this doesn't imply that the level is skipped since the next higher level can only be attained by fulfilling all the characteristics at the foundation. Thus, it is concluded that EAL KM is not ready to enter into Phase 4 as key elements of Phase 3 (such as establishing KM as a function and formulating KM strategy & policy) yet not addressed. Thus, based on the identified factors, recommendations are forwarded to move EAL gradually from Phase 3 to Phase 6.

5.2. Recommendations

The following recommendations are forwarded based on the research concluding remarks and with an assumption which covers the broad macro issues that this research addressed. Accordingly, the recommendations are made under four types of activities;

i. Outside interaction

- Establish effective collaboration and partnership with external parties for boundary less knowledge flow.
- Create virtual communities to facilitate exchange of knowledge across the units and/or organizations for continuous learning and improvement.
- Allow knowledge sharing scheme that enables the organization to bring in best practices, experiences and exposures seamlessly.
- Knowledge sources such as documents related with lessons learned, best practices and trainings should be maintained in a structured manner, communicated and accessible.

- Make the existing knowledge easily accessible and personalized to address focused target group interest.
- Empower and motivate staff for internal communication (within or between departments) to create supportive and positive corporate culture in knowledge sharing.
- Introduce incentive system that rewards knowledge sharing within or outside of the organization.
- Encourage staff to take up positions in other departments or organizations (for instance secondement in any fields of profession) to open up for new ideas.

ii. KM Policy and Strategy

- Top management commitment towards establishment of effective KM has to be enhanced and demonstrated with practical initiatives. The initiatives may include financing units that are working to facilitate the identification of needs in KM establishment and strengthening the structure.
- Clearly define KM policy and integrate same with the strategic objective of the organization to ascertain defined values & codes are attended.
- Establish KM function in EAL by appointing senior staff to coordinate KM activities.
- Launch a project that enables ET to formulate KM strategy and produce implementation plan.

iii. Training and awareness

- Introduce formal KM trainings into the existing training and development programs to popularize the importance of KM throughout the organization system.
- Build employees' skills in the process of knowledge creation and sharing so as to enable knowledge diffusion is a norm.
- Provide training on the existing IT tools and services with respect to their role in KM. For instance, make employees aware of the discussion forum on corporate portal, the KM tools in SAP portal and the knowledge resources in other systems as well.
- Create awareness on how informal networks (such as Communities of Practice) would support the organizational KM practices and enable the environment conducive to establish informal networks.

- Make employees well aware of the design and benefits of coaching and mentoring to institutionalize the programs.

iv. ICT infrastructure

- Improve ICT and IM infrastructure of EAL by evaluating current KM initiatives and to proceed to the higher maturity level.
- Optimum utilization of existing tools and services has to be ascertained.
- Make the existing knowledge sharing tools, such as intranet/portal, more interactive with users.
- ICT should be designed to suit underlying KM practices and support business transformation & competition.

5.3. Suggestion for Future Work

This study believed to flash light on what can be done to improve the KM practices of EAL towards its strategic objective. Nevertheless, further research is envisaged to enrich the study with diversified determinant inputs of all stakeholders (including customers, suppliers and other partners as well as internal sources of employees at outstations). Furthermore, it is the researcher's belief that the under listed generic points would also pinpoint possible research areas:

i. Further develop the KM maturity framework

Gauging KM maturity is not one time exercise; rather it should be done periodically for continuous improvement. In order to institutionalize the adopted model of Kruger's (2008), follow on research is necessary so as to formalize the model or enhance with other industry specific parameters, as applicable.

ii. Identify and develop metrics to KM

KM activities or initiatives that are being performed should be measured for their impact on the strategic objective by integrating same with the existing evaluation system, Balanced Score Card. To this end, the desired KM goals/benefits should be identified and individual metrics should be designed to incorporate into key performance indicators.

iii. Further research on other industries

This research could trigger other related research in Ethiopia context. Here it is worth to mention that as far as the researcher's knowledge no business organization in Ethiopia evaluated their KM maturity using any of the models. The situation also leads to the question of how business organizations perceive knowledge with respect to ensuring competitive advantage. On the other hand, measuring the organizational KM readiness is a critical step to understand the current status and determine where to go. Hence, taking this study as benchmark, subsequent studies can be done in the area of KM at different business organizations/industries.

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APPENDICES

Appendix 1: AAU support letter

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Addis Ababa University
College of Natural Sciences
School of Information Science

Ref: SIS/02/2014
Date: October 16, 2014

To: Ethiopian Airlines

Subject: Request for Cooperation

Dear Sir / Madam

Student Seble Abera (ID.No.GSE/1042/05 is a Graduate student in Information Science, Addis Ababa University.

She is currently conducting research on KM Maturity in Ethiopian Airlines.

I would like to thank you in advance for all the assistance that you would provide to the student.

With regards

Solomon Teferra (PhD)
Head, School of Information Science

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Appendix 2: Covering letter

Dear Sir/Madam,

I am a graduate student at AAU Information Science MSC program. Currently, I am doing my final thesis project on "Knowledge Management Maturity at Ethiopian Airlines". As part of my project, I am conducting a survey through this questionnaire to know factors affecting knowledge management maturity in Ethiopian Airlines (EAL) and hence to determine the level so as to forward recommendation/s on improvement areas. Thus, I kindly request you to co-operate with me to fill up the questionnaire. I assure you that the information gathered will be for academic purpose only and individual responses remain confidential.

Please help me with considerate and in time response to fulfill my study with valuable output.

Thank You
Seble Abera

Appendix 3: Questionnaire

GENERAL INSTRUCTIONS

Please answer the questions by drawing a circle around an appropriate number in a shaded box or by writing your answer in the space provided.

Please use the following definition while answering questions related with key words of Information Management and Knowledge Management.

DEFINITION:

Information Management (IM) *is the collection and management of information (not knowledge) from one or more sources and the distribution of that information to one or more audiences.*

Knowledge Management (KM) *is beyond information management*: it is the process of *creating, collecting, organizing, disseminating and utilizing knowledge to enable learning in organization. (Knowledge includes Explicit which is about already articulated knowledge by any means: such as in organizational manual, policy, guideline…etc and Tacit which is in the minds of the individuals/experts which is difficult to articulate).*

Unless specifically instructed otherwise, please answer ALL questions, one answer per item.

1. Name (Optional)?

2. Department?

3. Seniority/Service year?

> 20 years	**1**
10-20 years	**2**
<10 years	**3**

4. Please specify the level of management you are in?

Operational level/non-management	**1**
Middle Management	**2**
Senior Management	**3**

SECTION 1: ICT Management

Please use the code:

1	=	**Y**es definitely	**Y**
2	=	Yes, but not **S**ignificantly	**S**
3	=	No, but **P**robably within the next 5 years	**P**
4	=	**N**o	**N**

1.1 To what extent do Ethiopian Airlines (EAL's) Information and Communication Technology (ICT) activities comply with the following statements:

		Y	**S**	**P**	**N**
1	EAL is capable of **evaluating** an ICT system	1	2	3	4
2	EAL is capable of **designing** an ICT system	1	2	3	4
3	EAL is capable of **planning** an ICT system	1	2	3	4
4	EAL has an **effective** ICT infrastructure	1	2	3	4

1.2 EAL regards **ICT** and the management thereof as … (Please mark only **one** answer)

An enabler of knowledge management	1
Knowledge management	2

SECTION 2: Information Management

Please use the code:

1	=	**Y**es definitely	**Y**
2	=	Yes, but not **S**ignificantly	**S**
3	=	No, but **P**robably within the next 5 years	**P**
4	=	**N**o	**N**

5. To what extent does EAL **comply** with the following statements?

		Y	**S**	**P**	**N**
1	EAL has a clearly defined information management (IM) policy	1	2	3	4
2	EAL has a clearly defined information management (IM) strategy	1	2	3	4
3	EAL understands which information resources are crucial to the business	1	2	3	4

4	It is clear which managers are accountable for information resources	1	2	3	4
5	Key information is easily available	1	2	3	4
6	All employees are trained to access sources of information relevant to their job	1	2	3	4

6. Is EAL **proficient** in the following Information Management activities?

		Y	**S**	**P**	**N**
1	Identification of information needs	1	2	3	4
2	Acquisition of information	1	2	3	4
3	Information storage	1	2	3	4
4	Information distribution	1	2	3	4
5	Information retrieval	1	2	3	4
6	Information disposal	1	2	3	4
7	Protection of information	1	2	3	4
8	Determination of the value and cost of information	1	2	3	4

7. In EAL, the following Information Management **tools and services** have been institutionalized:

		Y	**S**	**P**	**N**
1	Inventory of information entities	1	2	3	4
2	Information management system	1	2	3	4
3	Databases	1	2	3	4
4	Information service/Library	1	2	3	4

8. The organization regards Information Management (**IM**) as … (Please mark only **one** answer)

A prerequisite for knowledge management	1
Knowledge management	2

SECTION 3: Formulation of Knowledge management principles, policy and strategy

Please use the code:

1	=	**Y**es definitely	**Y**
2	=	Yes, but not **S**ignificantly	**S**
3	=	No, but **P**robably within the next 5 years	**P**
4	=	**N**o	**N**

9. How would you **rate** the following statements?

		Y	**S**	**P**	**N**
1	EAL is aware of the power vested in knowledge, i.e. knowledge is seen as a strategic resources	1	2	3	4
2	Good knowledge management is one of the top five (5) internal priorities of EAL	1	2	3	4
3	The management of knowledge is supplying a direct input to the strategic management process i.e. the Chief Knowledge Officer is an active participant in the formulation of business strategy	1	2	3	4

10. Are the following goals important in **motivating** the establishment of knowledge management **practices** in EAL?

		Y	**S**	**P**	**N**
1	Improving work efficiency and/or productivity by producing and sharing knowledge more rapidly within EAL	1	2	3	4
2	Decentralization of authority	1	2	3	4
3	Releasing information more rapidly and making it more widely available to staff	1	2	3	4
4	Promoting life-long learning	1	2	3	4
5	Improving transparency	1	2	3	4
6	Improving working relations and trust within EAL	1	2	3	4
7	Making up for loss of knowledge (due to staff turnover, retirements, etc.)	1	2	3	4

11. In EAL, the following **initiatives** have been taken to manage knowledge

		Y	**S**	**P**	**N**
1	There is a conscious decision to invest in knowledge management	1	2	3	4
2	It is agreed upon that there is a need for hybrid knowledge management environments, i.e. technology and people	1	2	3	4
3	High-ranking knowledge champions are identified	1	2	3	4
4	There is a commitment from top management to the establishment of a formal knowledge management function	1	2	3	4
5	A decision was taken by top management to judge people according to their ability to share knowledge	1	2	3	4
6	A decision was taken by top management to constantly improve knowledge work processes	1	2	3	4
7	There is a conscious drive to get all employees involved in knowledge sharing exercises	1	2	3	4

12. To what extent does EAL **comply** with the following statements?

		Y	**S**	**P**	**N**
1	EAL has a clearly defined knowledge management (KM) policy	1	2	3	4
2	EAL has a clearly defined Knowledge Management (KM) strategy	1	2	3	4
3	The KM strategy has been communicated widely to staff	1	2	3	4

13. If EAL already has knowledge management (KM) strategy/strategies, which key element does it include? (If EAL **does not have** a KM strategy, please continue with **Question 4** below)

		Yes	**No**
1	Information management	1	2
2	Information technology aspects	1	2
3	Human resources management aspects (incentives, recruitment, training, mentoring, etc.)	1	2
4	Organizational aspects (communities of practice, decentralizing authority, networks, etc.)	1	2

SECTION 4: Implementation of Knowledge management

Please use the code:

1	=	**Y**es definitely	**Y**
2	=	Yes, but not **S**ignificantly	**S**
3	=	No, but **P**robably within the next 5 years	**P**
4	=	**N**o	**N**

14. In EAL, the following **initiatives** have been taken and organizational **arrangements** made.

		Y	**S**	**P**	**N**
1	Opening up bureaucratic divisions	1	2	3	4
2	The creation of a central coordinating unit for Knowledge Management	1	2	3	4
3	The appointment of a Chief Knowledge Officer (CKO) with executive status	1	2	3	4
4	Reorganization of offices (e.g. open plan offices)	1	2	3	4
5	Establishment of informal networks (e.g. Communities of practice – groups of practitioners working on the same topic but not on the same project, and regularly sharing knowledge)	1	2	3	4
6	Institutionalization of training and mentoring programs	1	2	3	4

7	Communication with customers	1	2	3	4
8	Establishment of incentive schemes for knowledge sharing	1	2	3	4
9	Communication with suppliers	1	2	3	4

15. Which of the following groups has the **overall** responsibility for knowledge management in EAL? (Please mark only **one** answer)

1	Human resources management team	1
2	Information technology team	2
3	Special knowledge management unit	3
4	Top managers	4
5	Others	5

16. In EAL, **staff** members spend an increasing amount of time on the following **activities**:

		Y	**S**	**P**	**N**
1	Informational meetings	1	2	3	4
2	Peer reviewing/quality reviews	1	2	3	4
3	Presentations of projects and activities	1	2	3	4
4	Information sharing by electronic device (e-mail, etc.)	1	2	3	4
5	Building databases	1	2	3	4

17. In EAL, good work practices have been outlined and updated on a regular basis, in **documents** such as:

		Yes	**No**
1	Training manuals	1	2
2	Best practices	1	2
3	Guidelines	1	2

18. Which follow-ups are conducted to assess the progress made in **implementing** knowledge management practices in EAL?

		Yes	**No**
1	The use of indicators to assess the implementation of knowledge management practices	1	2
2	Use of scorecards	1	2
3	Written/oral feedback from staff on achievements in knowledge management	1	2
4	Comparisons are made between EAL and other organizations in the airline industry	1	2

19. Do you consider that the **culture** of EAL has changed, in the following ways:

		Yes	**No**
1	Staff now consider that sharing knowledge will be good for their career in EAL	1	2
2	Staff spontaneously organize knowledge events such as meeting with staff from other divisions/departments	1	2
3	Staff make documents available to others more spontaneously	1	2

20. Has EAL experienced **difficulties in implementing** knowledge management practices, because of the following factors?

		Yes	**No**
1	EAL has put a strong focus on information and communication technology, rather than on people or organizational matters	1	2
2	Lack of time or resources to concretely share knowledge on a day-to-day basis	1	2
3	Resistance of certain groups of staff	1	2
4	Staff do not make documents available to others spontaneously	1	2
5	Difficulty in capturing employee's undocumented knowledge (know-how)	1	2
6	Concern that other organizations/general public would be able to access sensitive/confidential information	1	2
7	Knowledge and information management is not a top priority in the modernization program of EAL	1	2

SECTION 5: Ubiquitous Knowledge

Please use the code:

1	=	**Y**es definitely	**Y**
2	=	Yes, but not **S**ignificantly	**S**
3	=	No, but **P**robably within the next 5 years	**P**
4	=	**N**o	**N**

21. Does EAL increasingly rely on **outside knowledge** coming from the following entities/organizations to carry out its activities?

		Y	**S**	**P**	**N**
1	Between departments in EAL	1	2	3	4
2	Local governments	1	2	3	4
3	Peer organizations	1	2	3	4

4	Universities/Research centers	1	2	3	4
5	Suppliers	1	2	3	4
6	Customers	1	2	3	4
7	Consulting firms	1	2	3	4
8	Trade Unions	1	2	3	4
9	Others	1	2	3	4

22. **Staff** is encouraged to take up positions in:

		Y	**S**	**P**	**N**
1	Other departments in EAL	1	2	3	4
2	Local government	1	2	3	4
3	Peer organizations	1	2	3	4
4	Universities/Research centers	1	2	3	4
5	Supplier organizations	1	2	3	4
6	Customer organizations	1	2	3	4
7	Consulting firms	1	2	3	4
8	Trade Unions	1	2	3	4
9	Other	1	2	3	4
10	Secondees* from other organizations are frequently accepted (*Secondees: staff who are lent by one organization to another one – remain paid by their parent organization – for a limited amount of time)	1	2	3	4

SECTION 6: Assessment of Knowledge management Growth

Please use the code:

1	=	**Y**es, rapid growth (3+ maturity levels)	**Y**
2	=	Yes, but not **S**ignificantly (1-2 maturity levels)	**S**
3	=	No growth, but **P**robably within the next 5 years	**P**
4	=	**N**o growth, or decline in growth	**N**

		Y	**S**	**P**	**N**
1	Please reflect on the growth of knowledge management in EAL over the past 5 years	1	2	3	4

Thank you,

Appendix 4: Interview outline

Purpose: Academic - Final thesis project for MSC Program in Information Science

Thesis title: Knowledge Management Maturity at Ethiopian Airlines

Interviewer/student name: Seble Abera

Time: 30 – 45 mins.

Introduction:

- Introduce and explain the subject & the purpose
- Ask the interviewee the qualification and experience
- Request contact address
- Inform how long the interview may take

Questions:

1) To what extent do you feel Ethiopian Airlines in general or your specific Division/SBU supporting your requirement in relation to knowledge management with respect to:
    - The available Information and Communication Technology (ICT)
    - Information management activities

2) Do you believe knowledge is recognized as resource in Ethiopian Airlines? How do you explain knowledge for Ethiopian Airlines? From:
    - Principle, policy and strategy point of view

3) Is there structurally defined position (at organization/division/SBU level) for knowledge management related activities? What is your opinion on the existing and/or suggestion on improvement?

4) Can you give example/s from your own area of work that can be considered as challenges and/or opportunities to knowledge management at large; with respect to:
    - Knowledge sharing practices
    - Document – manuals, best practices, guidelines
    - Culture
    - Focus of the organization

5) How do you perceive Ethiopian airlines as organization and staff about external knowledge exchange (knowledge outside of the organization or department/SBU)?

6) What is your general reflection regarding the growth of Knowledge Management in Ethiopian Airlines?

Appendix 5: Sample size calculation

$$n_0 = \frac{(Z_{\alpha/2})^2 pq}{e^2}$$

$$n = \frac{n_0}{1 + \frac{n_0 - 1}{N}}$$

Where, N = Target Population

n_0 = Sample size

n = Calculated/Actual sample size

e = the desired level of precision, (taken confidence level = 90% where by $\alpha = 0.1$)

P = is estimated proportion of an attribute in the population (taken as 0.5 and q = 1-P = 0.5; for conservative estimate)

Z = normal curve that cuts an area α (the value read from statistical table)

N = 1,318

Management = 178

Non-management = 1,140

$\alpha = 0.1$ $Z_{\alpha/2} = 1.645$

$e^2 = 0.01$

$$n_0 = \frac{(1.645)^2\,0.5)(0.5)}{0.01}$$

$$n_0 = 68$$

$$n = \frac{68}{1 + \frac{67}{1318}}$$

$$n = \underline{\underline{65}}$$

N total = 1,318
n total = 65

Total #	Mgmt	Non. Mgmt
N	178	1140
n	9	56
K = (N/n)	20	20

Randomly picked **10th**
Sampled every **20th**